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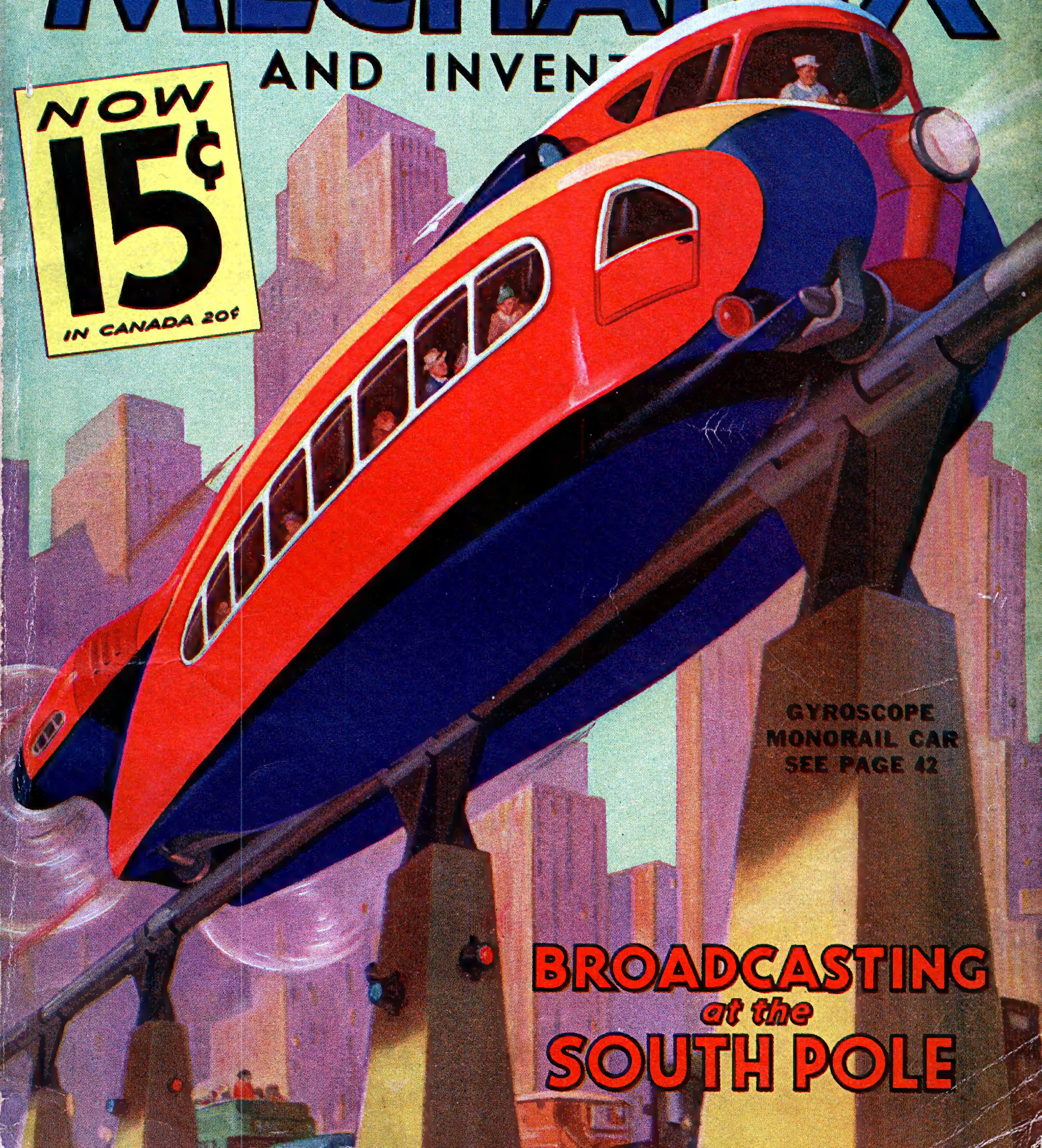

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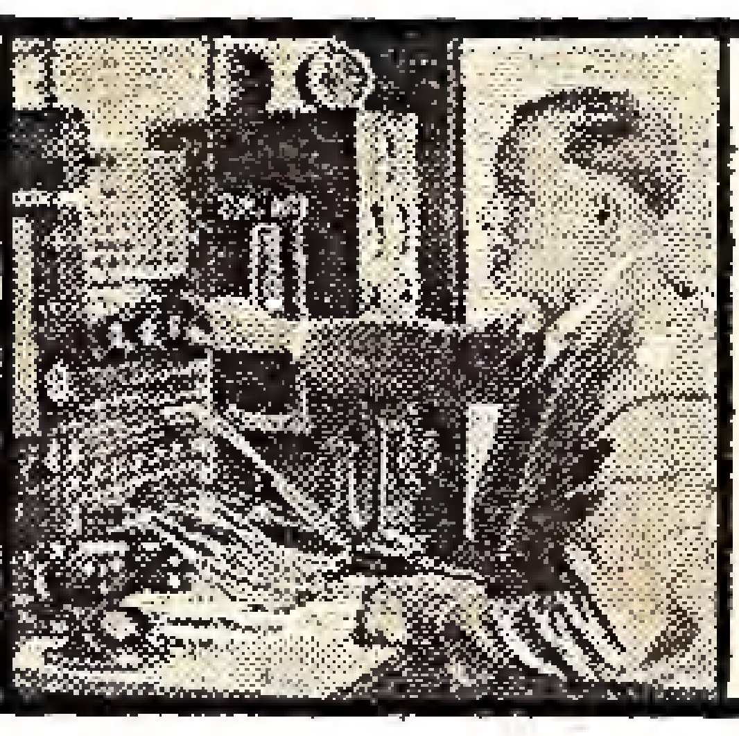

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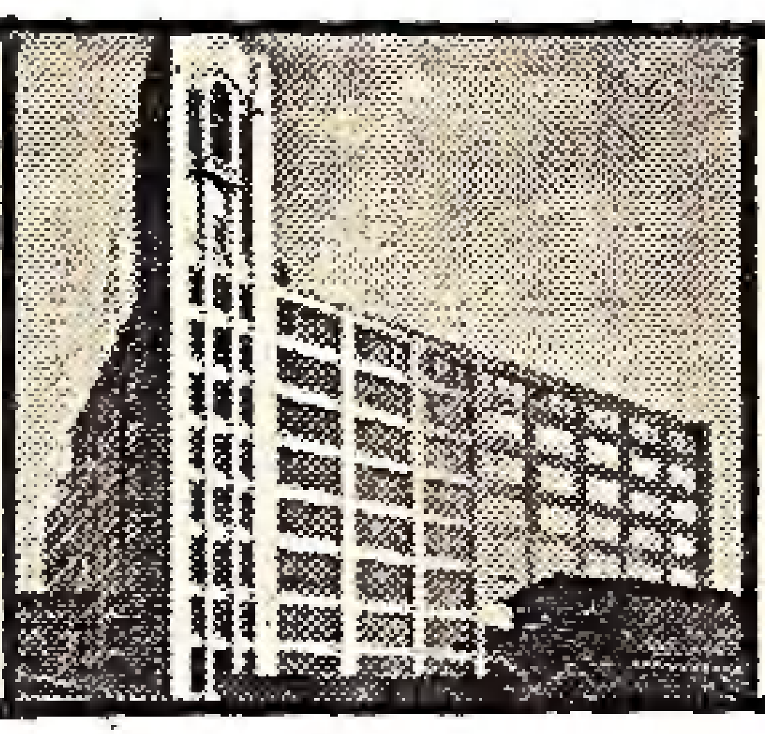

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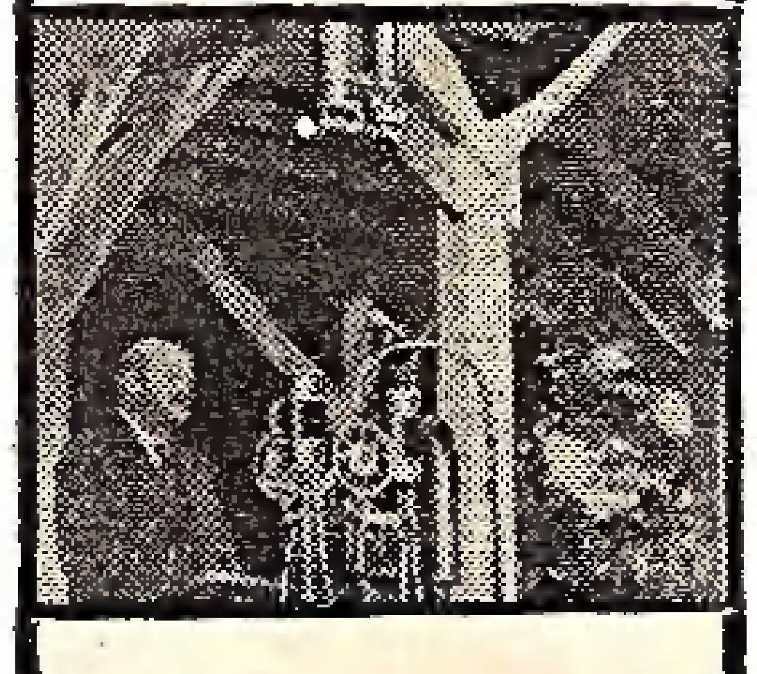

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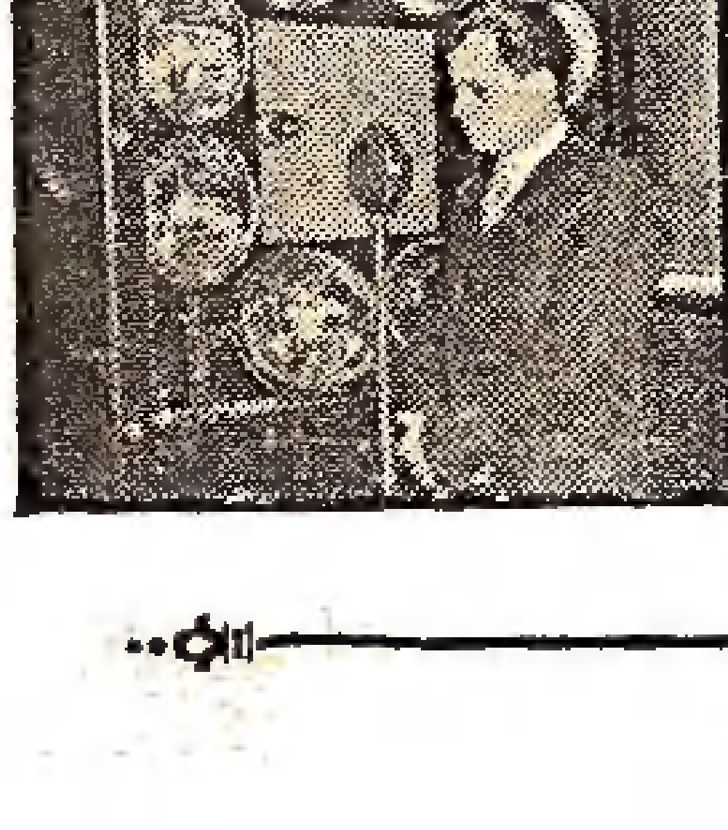

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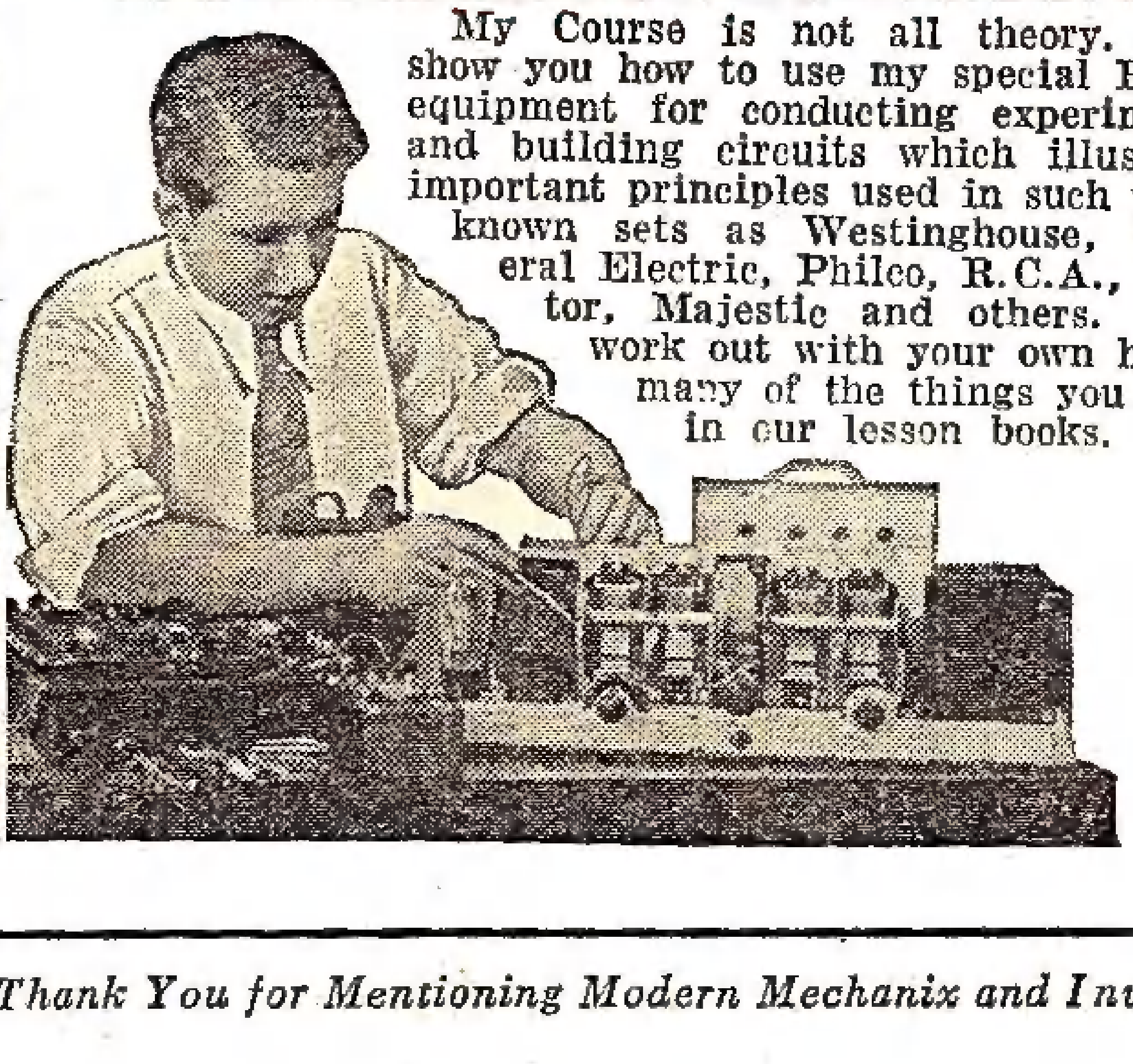

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MODERN MECHANIX AND INVENTIONS

Volume XI
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Published monthly by Modern Mechanix Publishing Co., 529 So. 7th St., Minneapolis, Minn., U.S.A. Entered as Second Class matter Sept. 20th, 1928, at Minneapolis, Minn. Copyright 1934. Advertising offices Chicago, 919 N. Michigan Ave.; New York, 52 Vanderbilt Ave. 15 cents a copy; $1.50 a year in U. S. and Possessions. In Canada, 20c a copy; $2.25 a year. Other Postal Unions, $2.00 a year. Printed in U.S.A.

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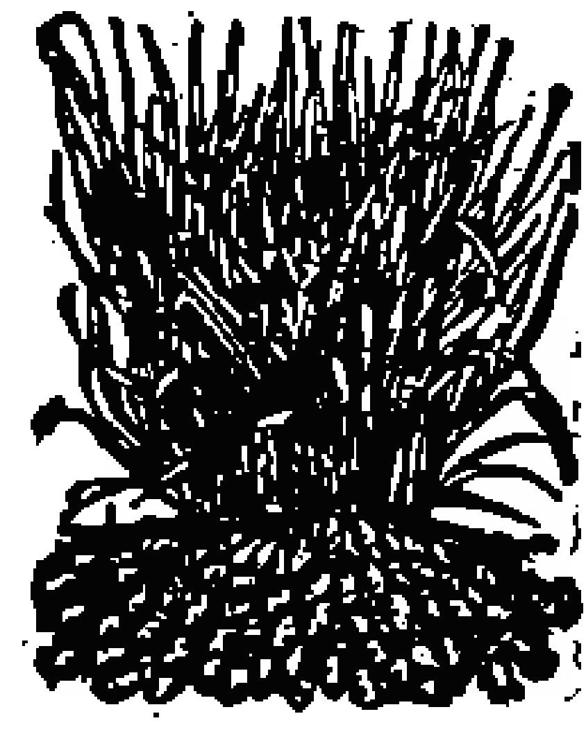

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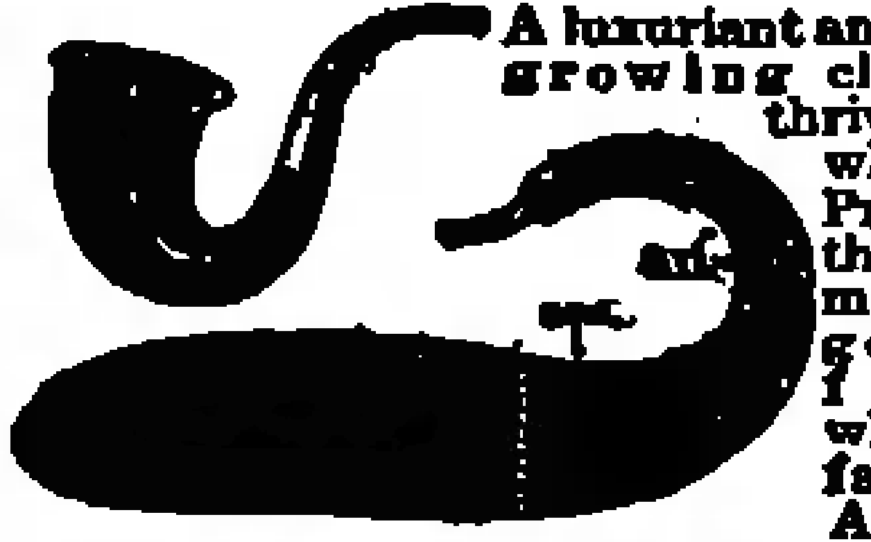

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Japanese Nest Egg Gourd

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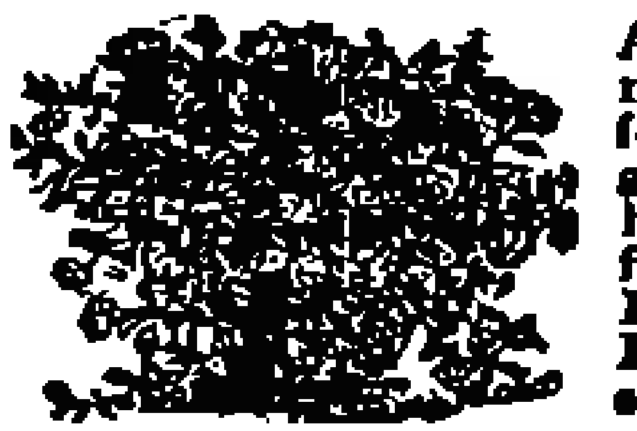

A universally admired favorite for house, flower garden or greenhouse. A very fine house plant. Lives for years. Is of the sweet scented variety, giving forth much fragrance. Also valuable on account of the perfume that can be made from it. **Seeds 15c pkt., 3 for 40c.**

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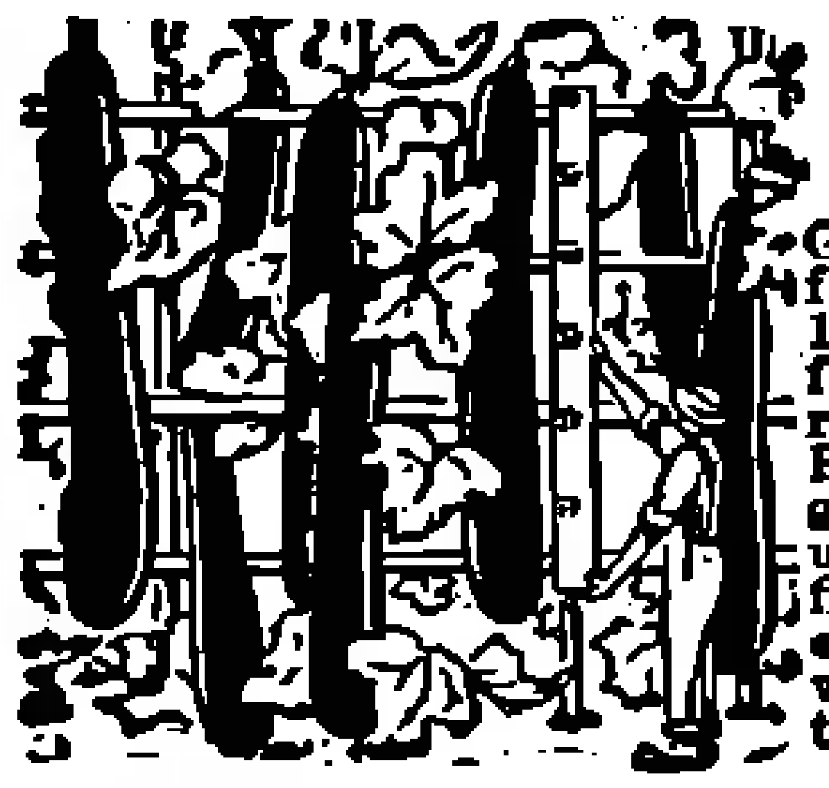

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Kudzu Vine

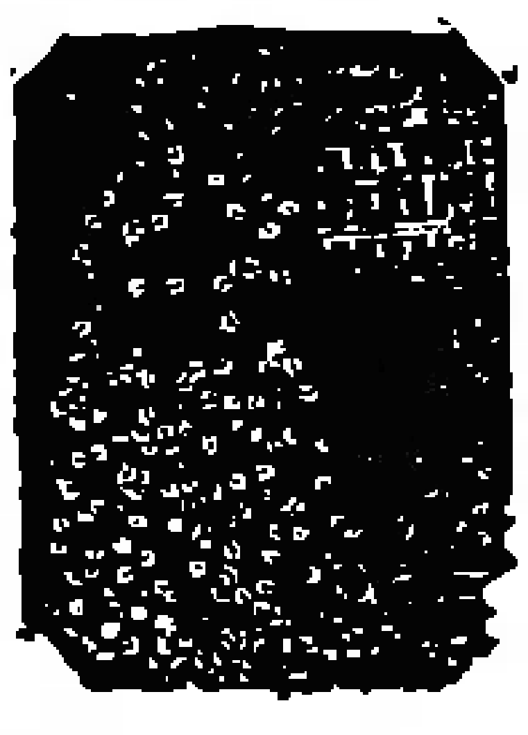
Most rapid growing vine known. Will grow 20 feet in one week. Luxuriant foliage, lovely purple flowers, very fragrant. Nothing to equal it for shade purposes and quick growth. **Seeds 15c packet, 3 for 40c.**

Yard Long Bean

Produces enormous crop of long, slender, round pods, of excellent quality for snap beans. Pods grow from 2 to 5 feet in length. Very tender and fine flavor. The vines are rampant growers; an interesting curiosity. **Seeds 15c pkt., 3 for 40c**

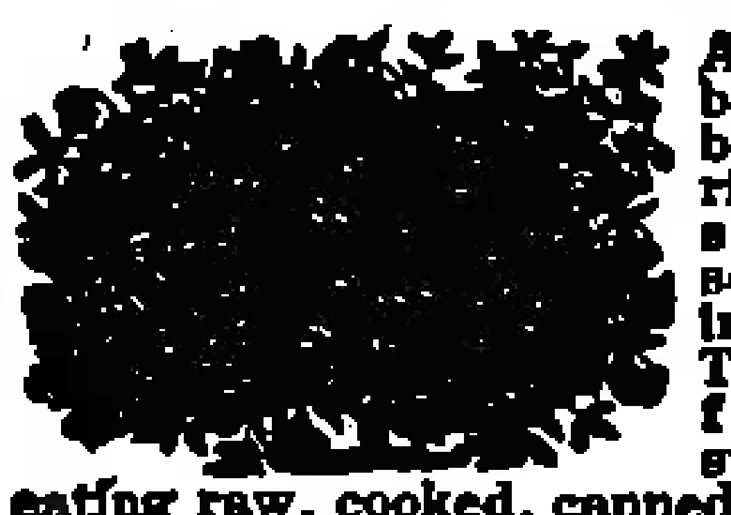
THE REMARKABLE FIREFLY PLANT A Vine that Blooms at Night

Fills the Atmosphere with Fragrant Aroma



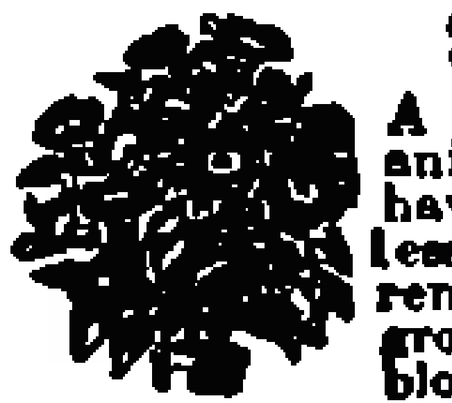
One of the most rapid growing vines known. Under favorable conditions this vine has been known to grow OVER 25 FEET IN A SINGLE WEEK. In a very short space of time indeed the Vine has climbed to a great height, and is covered with IMMENSE FLOWERS, from 5 to 7 inches in diameter. It is, indeed, a great novelty, for, unlike other plants, the flowers OPEN IN THE EVENING, and remain open until about noon the following day. In dull weather they will remain open all day. It is a most INTERESTING SIGHT to watch the opening and closing of the flowers as the clouds appear and disperse. As the flowers open they give forth the most DELIGHTFUL AROMA and the whole atmosphere around is full of scented fragrance. It is always the object of favorable comment, and much curiosity is aroused by people passing at night time as to the cause of the charming aroma, frequently stopping in an endeavor to satisfy their curiosity. **PRICE, 10 CENTS packet, two packets for 35 CENTS, POSTPAID.** JOHNSON SMITH & CO.

The Great Wonderberry



A luscious berry that may be grown and ripened from seed in any soil or climate in 3 months. The flavor is fine and unsurpassed for eating raw, cooked, canned or preserved in any form. The fruit is blue-black in color, and tastes like a luscious, rich blueberry. One bush will produce an enormous amount of fruit, yielding great masses of rich fruit all Summer and Fall. **Packet, 10c, 3 pkts. for 25c, postpaid.**

Shoo Fly Plant



A very remarkable Botanical curiosity you should have. Though quite odorless it is said flies will not remain in a room where it is grown. Bears very pretty blossoms; blooms summer and winter. Grows rapidly from seed. **SEEDS 15c pkt.; 3 for 40c, postpaid.**

Banana Musk Melon

Quite a curiosity. Looks and smells like a banana. Peculiar shape and its delicious flavor make it well worth your while cultivating. Flesh is deep and of exquisite flavor. Very high prices are obtained in choice city markets, as high as a dollar sometimes being demanded for one single specimen. **Seeds 10c, 3 pkts. for 25c.**

The Great Japanese Umbrella Palm A Graceful House or Conservatory Plant

Easily Grown From Seed Winter or Summer

The Japanese Umbrella Palm is a semi-aquatic plant. It is easily grown from seed either in a bowl of water or in very damp soil. Probably the most usual, as well as the most interesting method, is to cultivate the plant in a bowl or jardiniere filled with water, with two or three inches of good garden soil at the bottom. The seeds soon commence to germinate, and the plant shoots up stems two to three feet high and rapidly assumes a most pretty palm-like appearance, as shown in the engraving. The tops of the stems are surmounted by a whorl of umbrella-shaped leaves, of a waxy appearance. We will send a package of this seed, with full instructions for culture, **for only 15c or three packets for 40c postpaid.**

Butterfly's Own Bush

This plant is a veritable refuge or haven for butterflies, and it attracts all the most beautiful types of butterflies to the neighborhood. Bees, too, are very fond of it. It is a pretty plant bearing perfectly double flowers, ranging from white to rich crimson, deep red and pink, lilac and other delicate shades. **Packet 10 cents, 3 for 25 cents postpaid.**

CACTUS FROM SEED

Very curious, odd looking, strange species of plants; will thrive anywhere with little or no care. Flowers are of exquisite beauty and delightfully fragrant. You will be astonished at the odd looks of the Cacti just sprouting. **Packet, 10 cents, three packets for 25 cents, postpaid.**

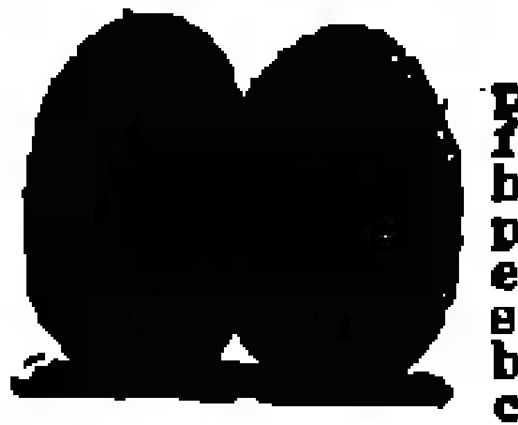
FERN SEED

Ferns can be grown from seed. Try your luck growing these beautiful plants for indoors or outdoors. Choicest mixed varieties. **Packet 10c., 3 for 25c.**

Chinese Cabbage

Novelty from China and should be grown in every garden. Seems to be a cross between Celery and Cos Lettuce. Flavor is more mild than any other cabbage. **Can be served on the table** and eaten raw or cooked like cabbage, spinach or lettuce or made into salad. Grows very rapidly, easy to cultivate. You can create quite a sensation by cultivating this remarkable novelty. **Seeds, 15c packet, 3 pkts. for 40c.**

FAMOUS MEXICAN FIREFLY PLANT



Beautiful hedge plant, grows 2 to 2½ feet high and resembling a closely clipped ornamental evergreen. The globe-shaped or pyramidal bushes are close and compact, and of a pleasing light green color. May be grown singly or in the form of a hedge or background. In early autumn the whole bush becomes carmine or blood red, hence the name of Mexican Fire Plant, or "Burning Bush," as it is sometimes called. **Selected Seeds, 10c**

Asparagus Sprengeri

The best plant for hanging baskets. Masses of rich, gleaming foliage droop in a very graceful manner. The foliage when cut for decorative purposes will last for weeks in water. The seed pods are very pretty red berries adding to its beauty. **Packet, 25c, 3 pkts. for 65c postpaid**

TREE OF HEAVEN

This splendid ornamental tree is a native of China, and is called the Tree of Heaven, on account of its great beauty. Very hardy, thrives in any soil, no matter how poor, and grows from 6 to 10 feet high from seed the first summer. The leaves are from 5 to 6 feet in any length, giving it a grand appearance. Nothing outside the tropics can rival it for lawn decoration. Large panicles of bloom, followed in season by great clusters of colored seed pods, make the tree a continual thing of beauty. **Packet, 15c; 3 packets 40c**

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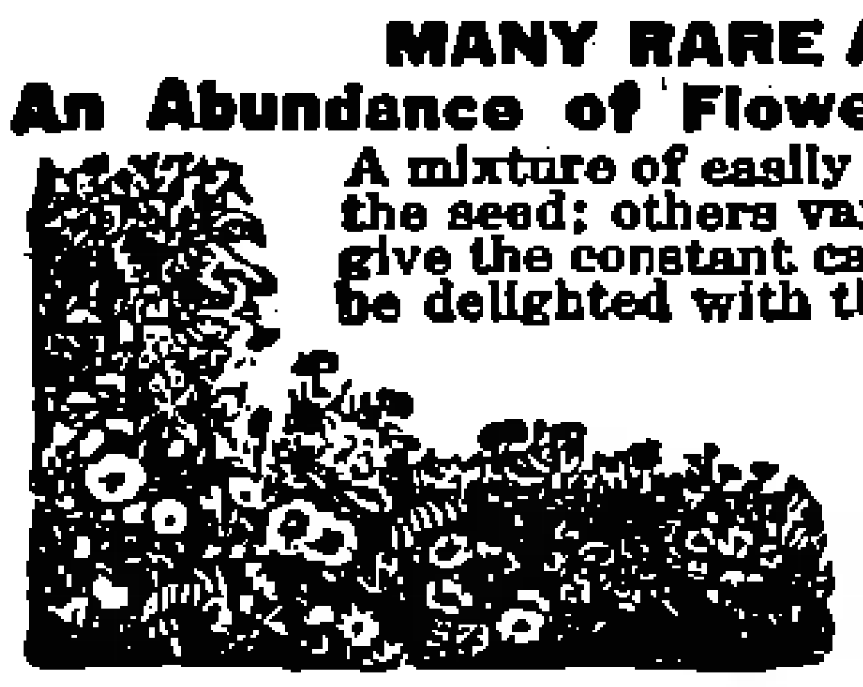

A mixture of easily grown annuals that bloom very soon after sowing the seed; others vary in their time of blooming. Those who cannot give the constant care necessary for finely arranged flower beds will be delighted with the Surprise Wild Flower Garden. Will prove a continual surprise and pleasure, as new varieties and the old garden favorites flower successively throughout the season. There are over a hundred varieties of seeds. Many of the plants may be taken inside as house plants and will bloom during the winter. Fine for children, also teachers for school gardens. **Packet, 15 cents, three packets for 40 cents, Postpaid.** J. S. & CO.

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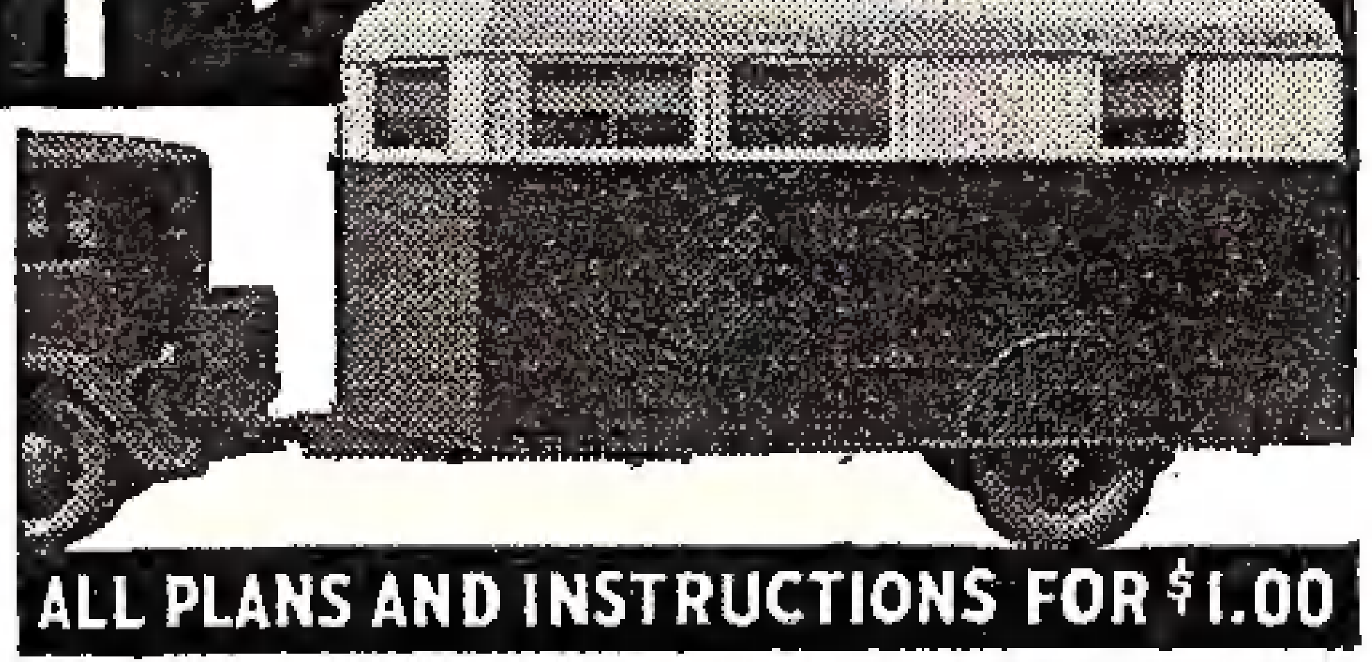

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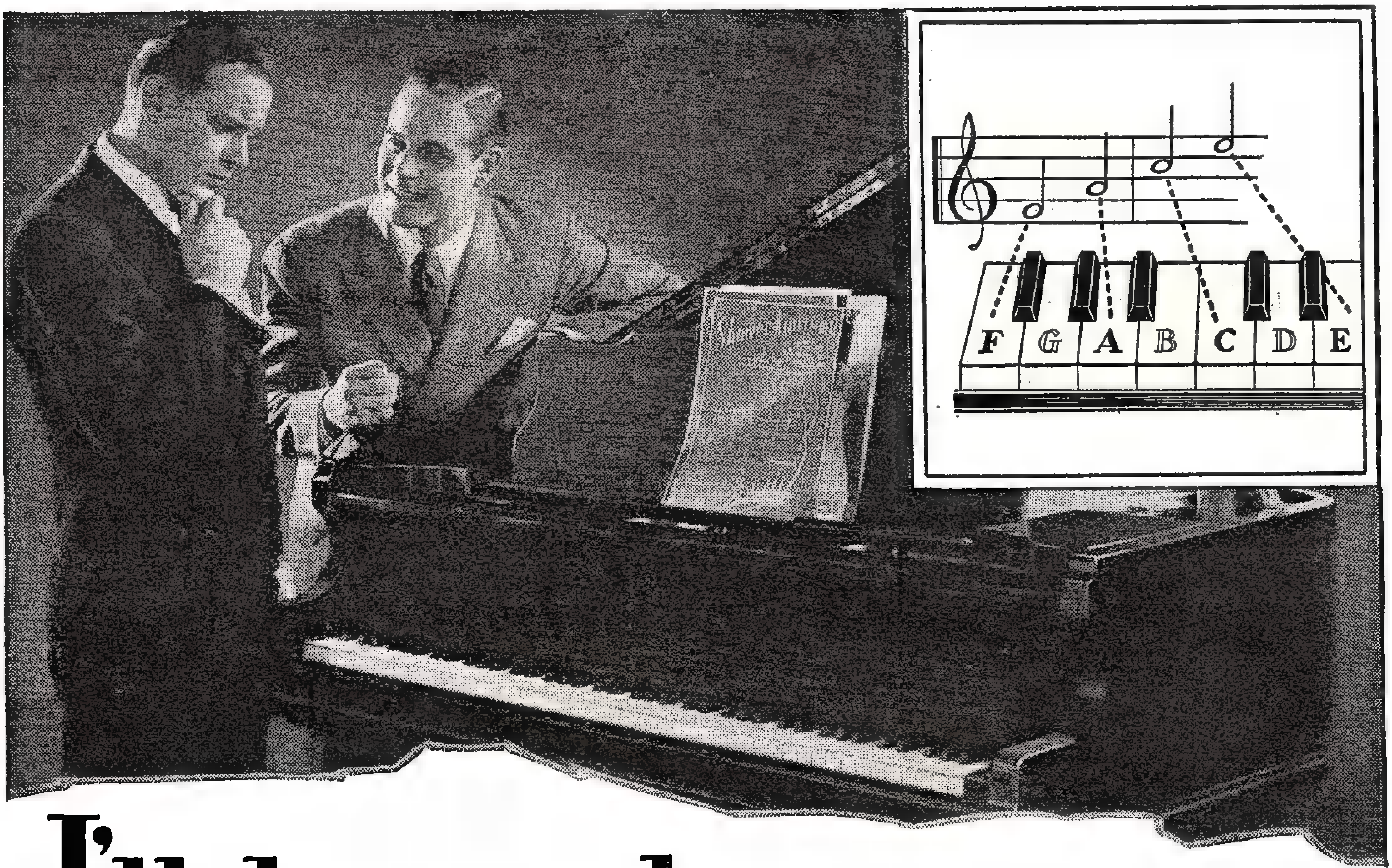

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Here are the latest additions to the membership of the M-M "All Sorts" Club. Left above, two boats built by boys at Camp Shawnee, Twin Lakes, Pike County, Pa. Center is the All Sorts built by W. R. Bell, of Milwaukee. At the right is shown the lovely All Sorts built by Henry S. Beveridge of Portland, Maine. This All Sorts design was justly popular and as we receive more snapshots from All Sorts builders we will add them to the album, lads!

Chips from the EDITOR'S WORKBENCH

Andy presents a galaxy of unusual letters from fans who have had a good season with the building of cars, planes and boats.

WE HEAD the column off this month without much ado because we have a nice run of seasonable letters—all about ice sleds up north, and all about sailin' boats in sunnier climes.

Some fellow is coming along with a really practical snow scooter, or snow sled, or snow hog—call it what you will—and for the bleak months of the year his stuff will be king of the pile. So far we have seen but one snow sled idea that looked right. That was the one built by that chap in Michigan. Remember?—A toboggan with twin wheels and a Henderson four to drive the thing. We are in hopes plans for such a sled will show up. A practical vehicle for navigating difficult or drifted roads or cross country reaches would be eminently serviceable.

Ice sleds are a different breed. They are the humming birds of the species. They toil not, they do nothing but spin. The big idea is to go places quickly. Here's a letter:

Wm. Lusk, 2614 Clifton Park Avenue So., Chicago, Ill., has cooked up a safety lever for shotguns which helps sighting, insures proper stance and prevents gun being fired unless actually held to the shoulder and aimed.

6 Spring St.,
Webster, Mass.

Dear Andy:

I have enclosed a snap of my iceboat. Whether it is good enough to print in your column of fan mail is up to you to decide.

I designed and built the boat. Wood was used for the complete fuselage. I used tubing for my motor stand. The boat is eleven and one-half feet long and six feet wide on the rear runners.

I have used a souped up Harley 74 with my own propeller for a power plant. The boat with two passengers and myself did do 75 miles per hour without tail wind help.

I have tried tractor type boats and the reason for building a pusher type, I found them more practical and it has a bigger factor of safety over the tractor type.

Yours very truly,
Henry J. Kokernak.

Sorry that H. J.'s photo wasn't clear enough to run.

* * *

And as Mr. Kokernak yearns for a tractor type, in comes a letter from Frank Francione, of Trenton, N. J. Frank is an old friend of mine, and we've written before. While you cannot discern from the relative comments concerning the advantages of tractor or pusher prop for ice sled work, I'm inclined to favor the pusher, myself. This is from a purely reasoned standpoint, and I may be all wrong. I know that aerodynamically a prop is more efficient up front, but I feel that it's better to have the weight concentrated aft, and steer with a light runner up front. But see what Frank has to say about his sled.

* * *

53 Chase St.,
Trenton, N. J.

Dear Andy:

I have been receiving and reading the M. M. for the last two years, and also have the Flying and Glider Manual and the '33 manual. I would like to get the 1931 manual, if you have it would you please send it. I am also sending you a few pictures of the ice sled I have built of my own design. I built her last fall. I gave her a try-out on the ice and it certainly was worth my effort. It is 12 feet long, 20 inches wide, 22 inches deep. It will do about 30-35 on ice with a 6 H. P. engine. I have made a pair of floats for it but the result was not so good. It went very slow. She would head in the wind and stay there.

So I will be leaving you as one of your readers of M. M. Please do not forget to send the 1931 manual.

Thank you,
Frank Francione.

* * *

Frank's letter bears me out in my contention that whatever the merits of tractor vs. pusher may be, the straddle bug idea for water is all wet in more ways than one. And it gives your Uncle Andy a chance to say I tolja so once more.

* * *

Though I haven't room for the letters of these good chaps, I want to doff my topper to Messrs. Beveridge, Brown, Bell and Cullin, who sent in shots of the All Sorts I asked for in a recent column. And off to the top of the page we have the pictures of the boats built from Farmer's design of All Sorts by Camp Shawnee boys, by W. R. Bell, and by Henry Beveridge. Thanks again to these men for responding to the call for shots for an "All Sorts Album." Last month we ran a picture of Mr. Cutler's boat. Any more of these photos on the way? Hurry up! I know over a hundred plans were sold. I'd like to initiate a few more members.

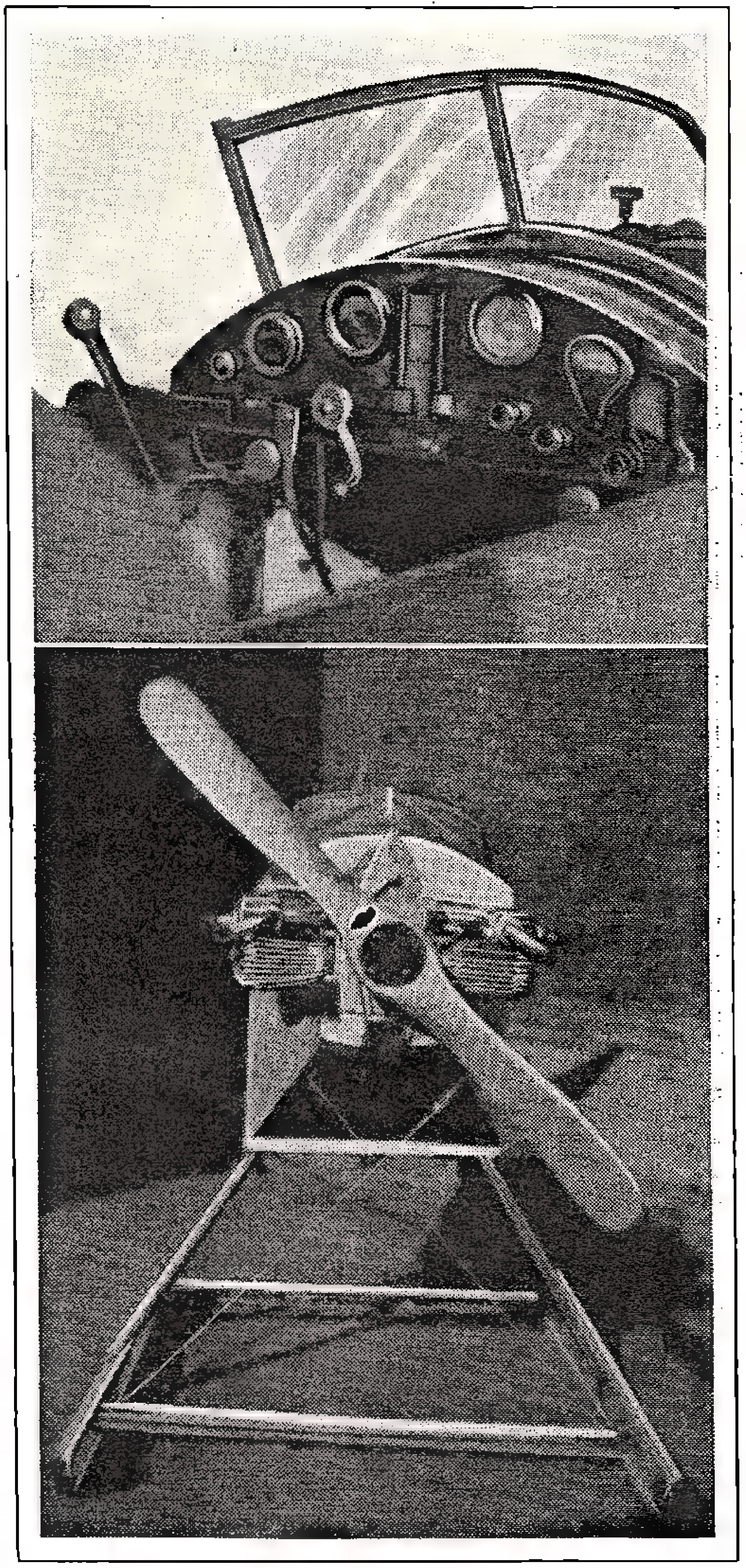
Let's give out numbers! Here y'are boys: Andy hereby officially gives you an "All Sorts One Design" club number which you can carve on the thwart of your boat. In order of appearance at my spindle:

No. 1—Henry S. Beveridge, Portland, Maine.
No. 2—W. R. Bell, Milwaukee, Wis.
No. 3—Cutler H. Brown, 729 So. St. Andrews Pl., Los Angeles, Calif.
No. 4 and No. 5—Built by Camp Shawnee, 541 Pelham Rd., Mt. Airy, Philadelphia, Pa., under direction of B. H. Cullin.

There y'are, me hearties, and Mr. Cullin, you've got the task of assigning the proper number to the proper boat, since your camp built two of them.

Smart idea, that. Letting the lads of a good and well organized camp build a project like this from the pages of M-M. Most cases the boys already know the thing to be built by heart, having seen it in these pages. They read M-M, too.

A Super-pursuit Ice Wagon



Mr. Frank Francione, of Trenton, N. J., believes in instruments. This should delight the heart of every kiwi who is instrument conscious, eh, what? These shots are of the good little ice sled built to test out a 2 cyl. motor he made.

Why'n chu men get together and let me hear when you get the numbers on?

I'm turning to the Sunray club next.

* * *

Since spouting a bit about light cars last month, I have a most interesting letter about what one ardent M-M reader did with his pet building project. Sh! It's an Austin!

Garnerville, N. Y.

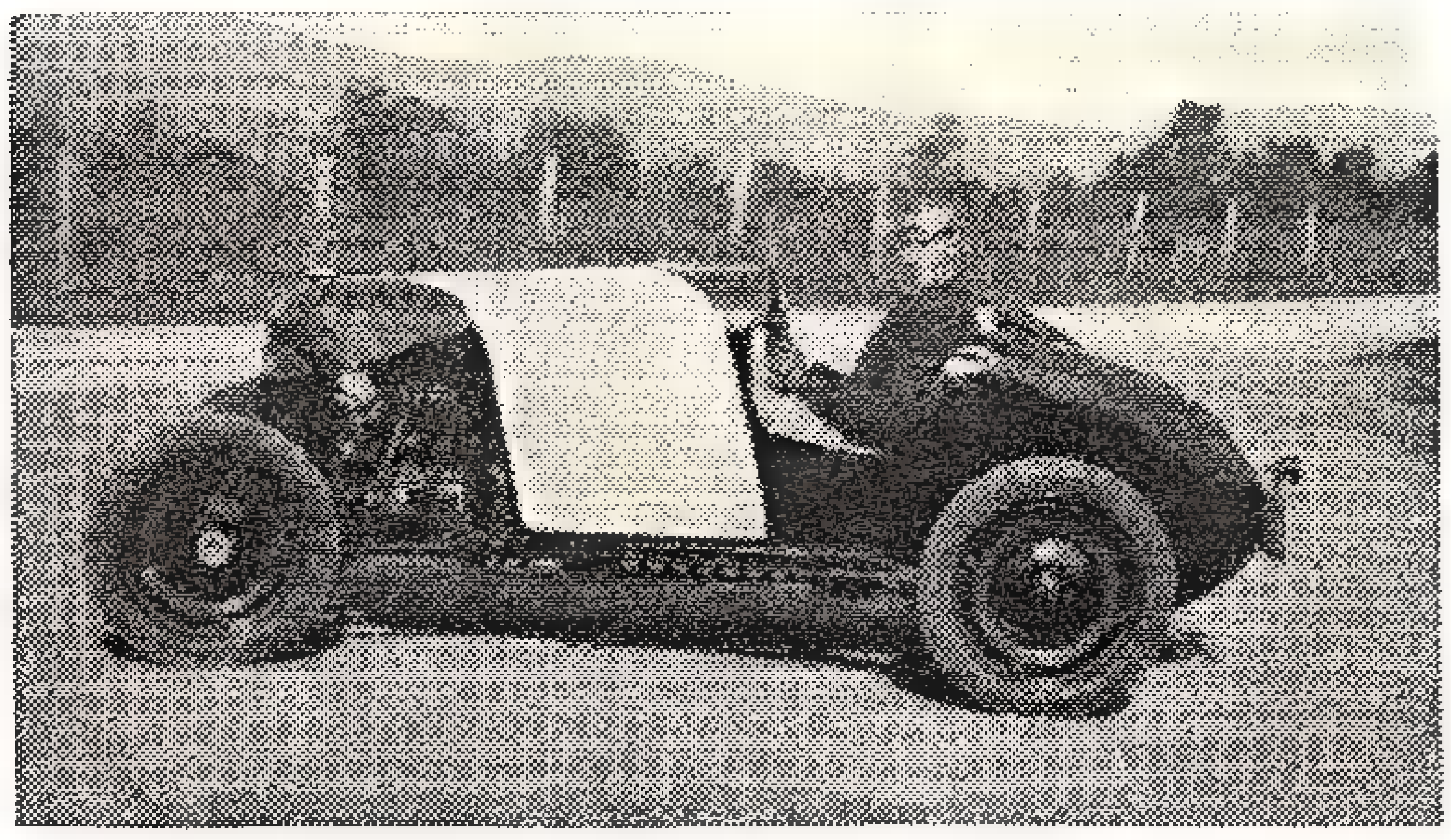
Dear Andy:

Enclosed find a couple snaps of my converted Austin. Converted I say, but only in body and springs or frame. Everything is stock except the special arm on the steering gear and a 12 inch extension on the front of

(Continued on page 14)

Home-made Scuttle Bugs

(Continued from page 13)



McKinley D. Allison, of Garnerville, N. Y., built this snappy speedster from one of the little Austin chasses.

the frame. I also flattened the rear springs out.

The body is 18 inches wide at the dash so there is just enough room for two persons. The back part is made of aluminum hammered to fit and the hood and cowl is of 28 gauge galvanized iron. The radiator shell is made from the two back corners of the body riveted together in the center. The motor is just as it came from the factory and though I don't know the R.P.M. the car does 65 M. P. H. by a good speedometer, 75 by its own. Not bad for a crack-up job. Cost me $8.00 to build the body and the other little parts.

Run the picture if you want and any information about the car will be gladly given if a stamp is included. Have read your magazine since it was born.

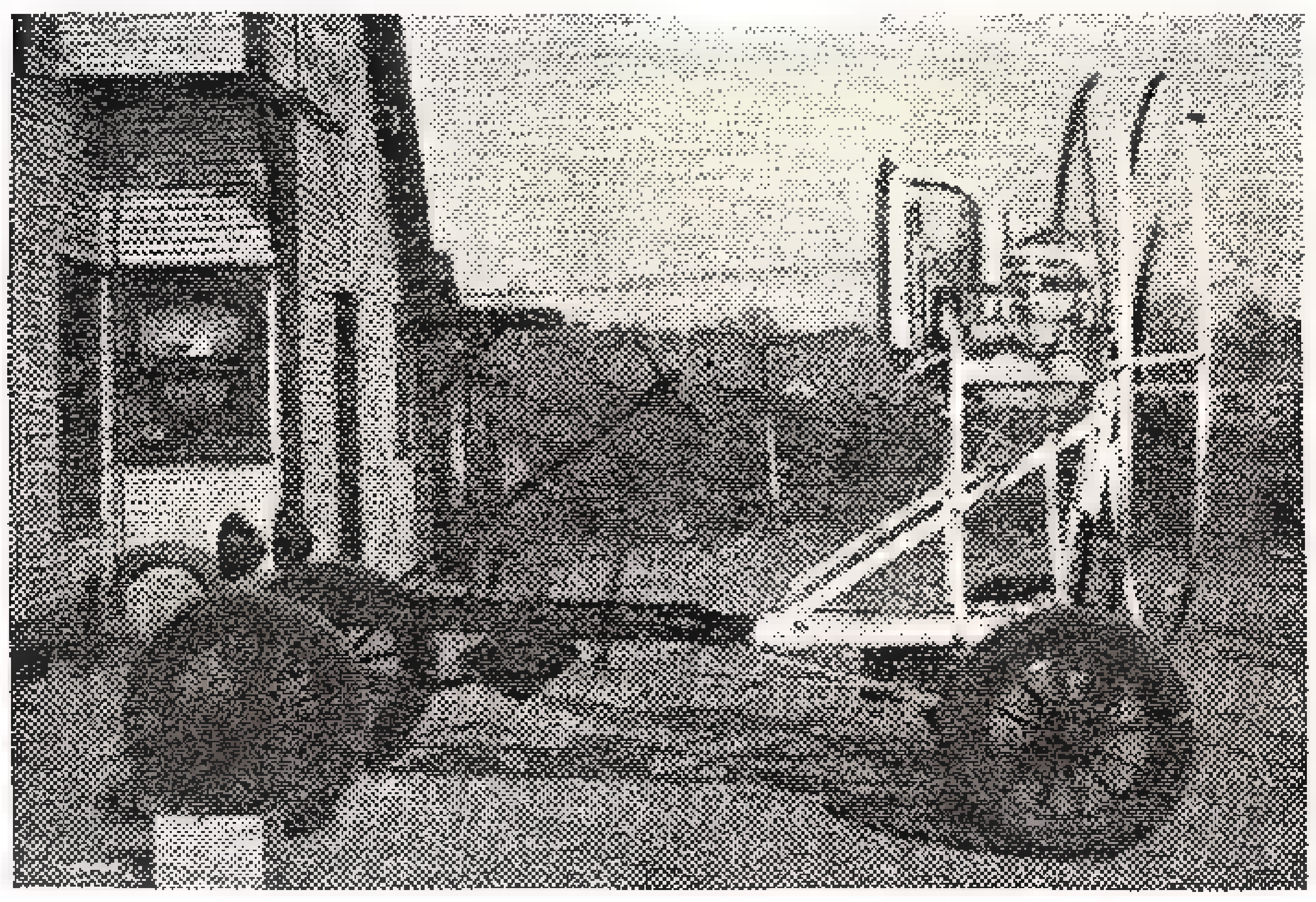
Sincerely yours,
McKinley D. Allison.

* * *

—the pic of Allison's car appears above. Cute little buggy, isn't it?

Sign-off news: Ritchie Thornbury, reader since the days of the Alco sportplane plans (remember?) returned to Ireland from this side, there building the Alco with a Gnome rotary and Heath Floats. I got a big bang from his letter, too long to publish here. The ship was wrecked before flight while taxiing.

Here's his letter in part, the rest being too long to run:



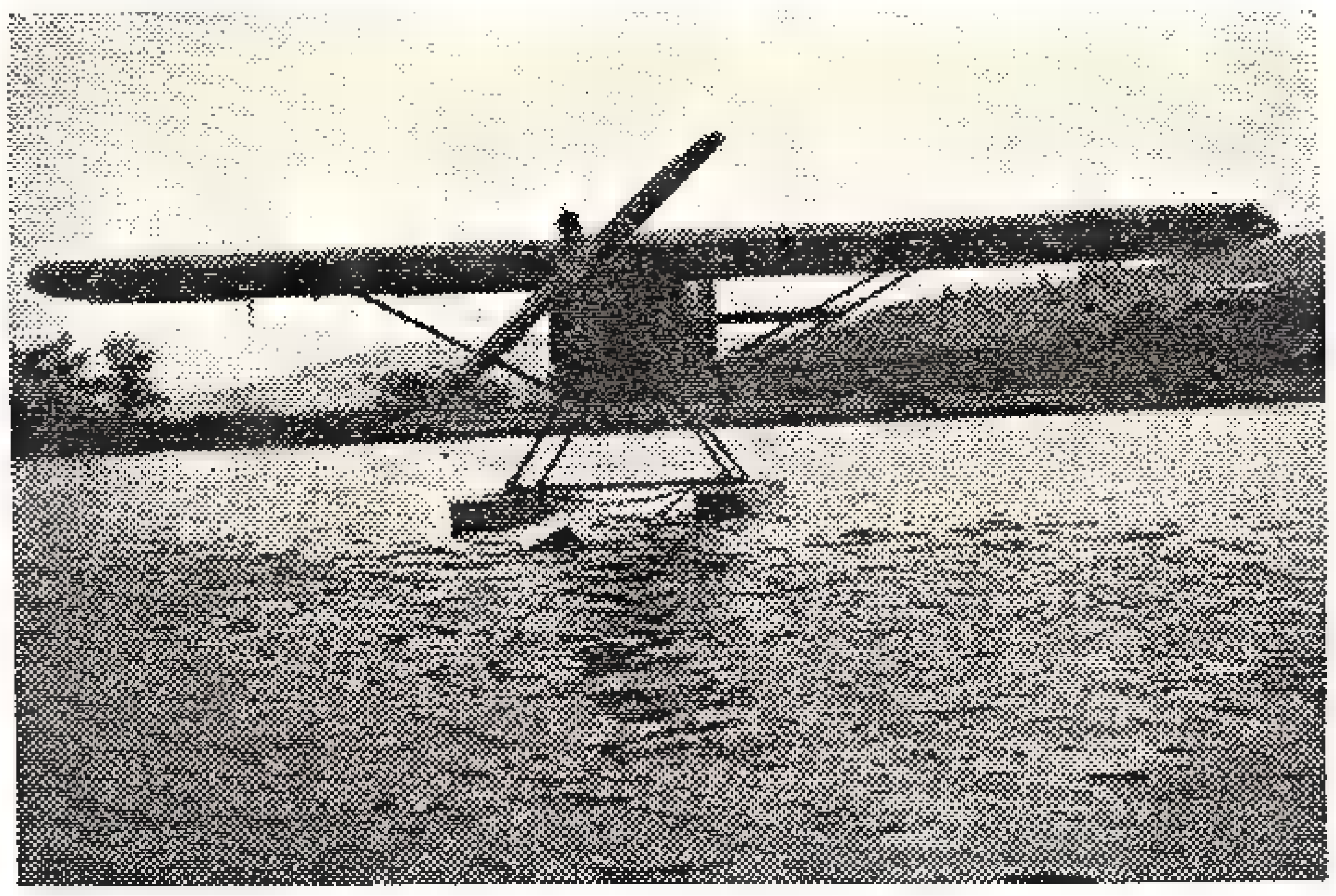
Frank Howard, Jr., of East Palestine, Ohio, built this wind wagon on a Model T chassis with Ford Model A power.

. . . I am enclosing a few shots of the little plane I built. You will hardly remember, Andy, but I wrote to you once about what you thought of a Gnome 50 h.p. motor and you said you thought they were angel makers. You were right. The plane was the Alco Sport published in M-M, the floats were the Heath, out of M-M. I had quite a job to balance her in the water but when I got the rigging right she went nice. . . . The water cut the edge of the prop to pieces. I never had any lessons and thought I could take it up myself. Had a few spills, and finally smashed the ship to matchwood. . . . Now I'm building a Wanderboat, to be powered with a Dodge, suped up. . . .

—and thank you Richard Thornbury, for the will to experiment and the good humor to laugh it off. Most fellows in the experimental aviation racket are like you—good to the last drop.

* * *

Seems like the wind wagons have it this month. You fellows who have been good enough to send me pics of your projects can rest assured that if the thing is clear enough to make a good cut from we'll run it, and you can show your friends.



Mr. Ritchie Thornbury, of 95 Ravenhill Rd., Belfast, Ireland, returned to the old country and built this Alco on a set of Heath Floats. It taxiied nicely until—it hit a stump!

Wonder how many "Buddys" have hit the drink since the plans were published?

* * *

Another letter from the wing wagon boys comes from Frank Howard, Jr., of East Palestine, Ohio, who, too, has a letter far longer than we can run. But I'm running the picture of his little buggy off here to the left, and here are some of le petit details, as we used to murmur in France.

. . . The engine is a model A, the chassis is a model T. The conversion is like the Pietenpol Aircamper. No bearings changed, no thrusts or anything. We do 65 miles and can do 75 when a new carburetor is put on.

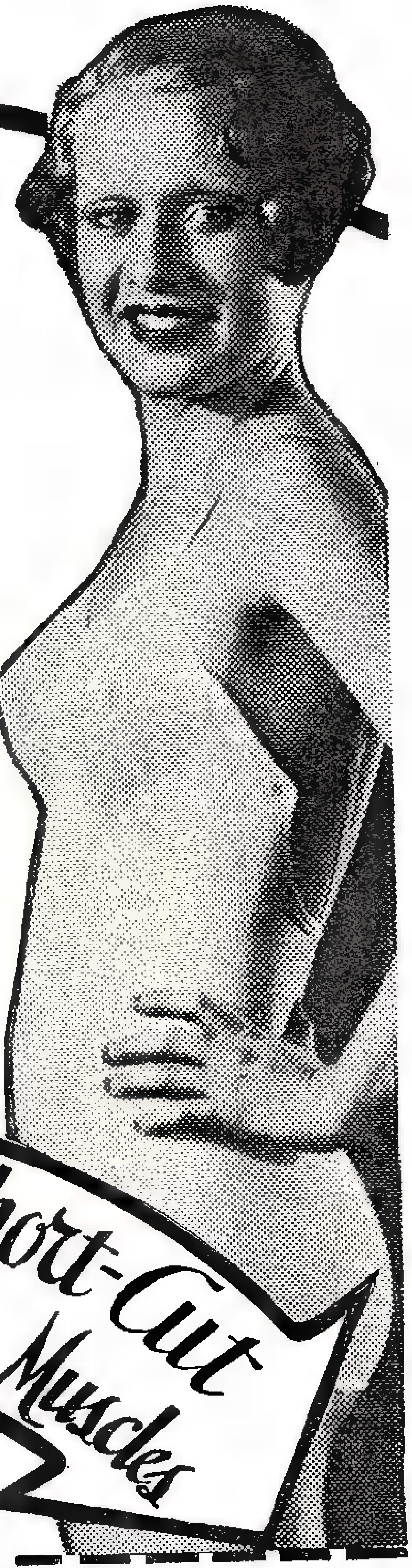
This outfit sure draws the crowds around it. I have had several chances to use it for advertising purposes.

I am interested in aviation and have 14½ hours to my credit. I would appreciate hearing from all of you aviation fans.

Yours truly,
Frank Howard, Jr.
E. Palestine, Ohio.

And that, sirs, is all from the tool shop front for this month. You should see what I have for next issue!

Would You Dare Ask This Girl for a Date?



SHE IS very pretty—and look at her stunning figure! Suppose *you* should meet this lovely girl—would you dare ask her for a date? Or would you be self-conscious about your appearance? Would you be ashamed of your poor physique in comparison with her perfect beauty? Would you say to yourself, "What could a beautiful girl like that see in me? Why, she'd laugh at my skinny, funny looking body. I'd look like a scarecrow alongside of her!"

Get a New Body—Quick!

Let me give you a new body—a handsome, muscular, powerful body—in less time than you think possible! Let me show you how easy it is to gain superb health, strength and vitality by my amazing new method of "MIRACLE EXPANSION". No old-fashioned, tedious exercise, no apparatus. This is the modern, quick way to develop a brawny, beautifully proportioned body.

Here's Your Short-Cut to Health, Strength, Muscles

FREE
BOOK TELLS HOW

Send for my eye-opening book, "Miracles in Muscles". Learn how, "Miracle Expansion" will make you over—will cover your body with inches of solid muscle—will give you thrilling, dynamic health. Send your name and address today.

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39 Union Square, West,
Dept. W-2,
New York City

Harry Titus, Director,
Titus School of Physical Culture, Dept. W-2,
39 Union Square, West,
New York, N. Y.

Dear Titus: Send me "Miracles in Muscles", explaining your new short-cut to health and strength through Miracle Expansion.

Name..

Address..

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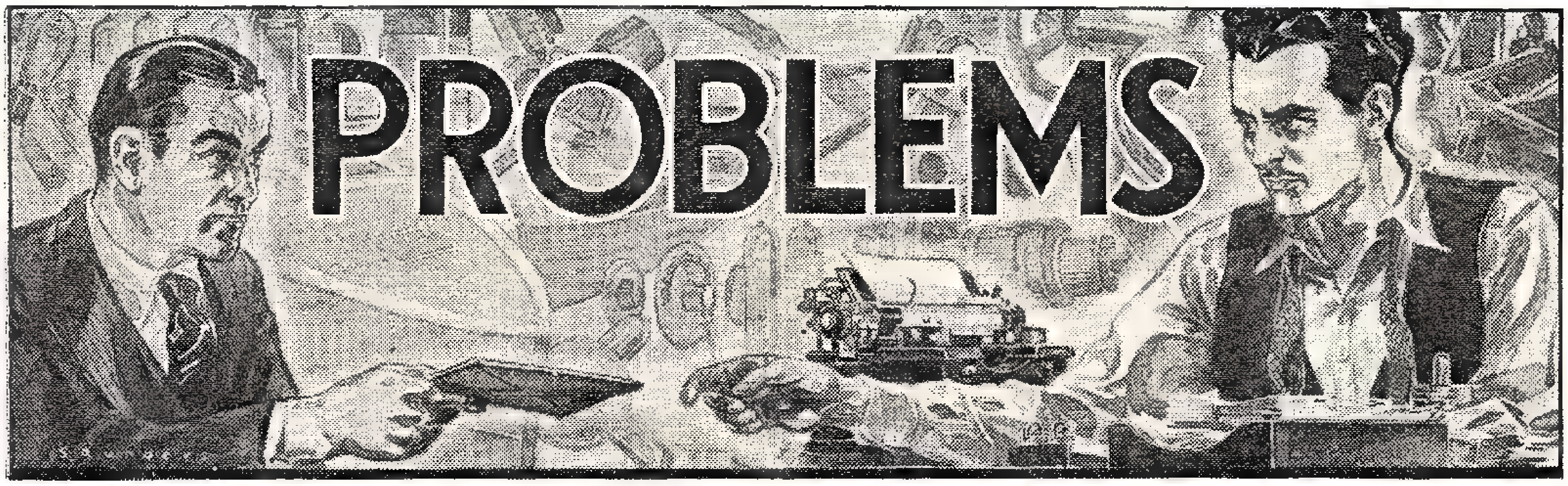
PROBLEMS



A department where that troublesome problem will be answered for your benefit as well as others.

TWO MINDS—A SINGLE THOUGHT

I have come to believe that the $1.50 I invested in your magazine in the form of a subscription is the best investment I have ever made.

However, I have one suggestion to make: why not add an additional two pages for a sort of forum and let the reader comment on articles read and learn how other readers react when they read certain articles.—R. D., Los Angeles, Calif.

Maybe it was the influence of the stars or a case of thought transmission or possibly just plain coincidence, but the editors had the same idea a few days earlier.

Well, here it is—a department for the readers. As many questions of a general nature as possible will be answered here. Letters of praise and criticism are welcome, but all correspondence requiring answers must be accompanied by a stamped and addressed envelope.

* * *

IT WORKS AND IT DOESN'T

Your B Eliminator on page 93 of the Dec., 1933, Modern Mechanix was the berries. No more messing around with batteries. G. S., Westmont, Ill.

I constructed the B Eliminator and am only able to get 2 volts. I am using 60 watt lamps with '01A tubes. I have tried 99 tubes and 2 type 80 tubes. Have you tested this circuit?—H. H., Shreveport, La.

The circuit was tested. If properly constructed and carefully checked, the B Eliminator will work. H.H. should make sure the filaments light. It appears that a filter condenser in his output condenser is shorted. Installing different sizes of electric bulbs merely affects the output, not the rectification of the eliminator. W.G.S., of Saratoga, N. Y., who is also having some difficulty should follow the above suggestions. T.C.H. of Rugby, N. D., evidently has a shorted tube. Check the prong connections and wiring.

* * *

WHERE IS THE KNOCK?

I have a Rockne that has a knock in it when you get up a little speed, but when it idles you can't hear a thing. It appears to be in the third or fourth rod. I took the motor down completely, checked the timer, oil pump, chain and everything, but found nothing. The dealer took it down four times and found nothing. Can you give me any advice?—P.A.M., Service Station, Danville, Ohio.

It is difficult to determine the nature of the knock from this brief description. Test each cylinder for the knock. Heavy oil may eliminate it. Determine whether the knock exists when the car coasts downhill. If so the knock probably is in the rear end or the transmission, since possibility of trouble in the connecting rods has been checked.

* * *

FORTUNES IN FUNNIES

In Modern Mechanix' November issue the article "How Comic Cartoons Make Fortunes" stated "today editors are eagerly looking for more cartoonists with better ideas or funnier cartoons. Will you kindly send me addresses of these editors that are looking for new material?—C.V.L., Catlettsburg, Ky.

The statement that editors are eagerly looking for more cartoonists is a general statement. We have no list of editors who are on the lookout, but you can bet your bottom dollar if you have good ideas, all you have to do is submit them to the various syndicate home offices whose addresses you can get from your local newspaper.

* * *

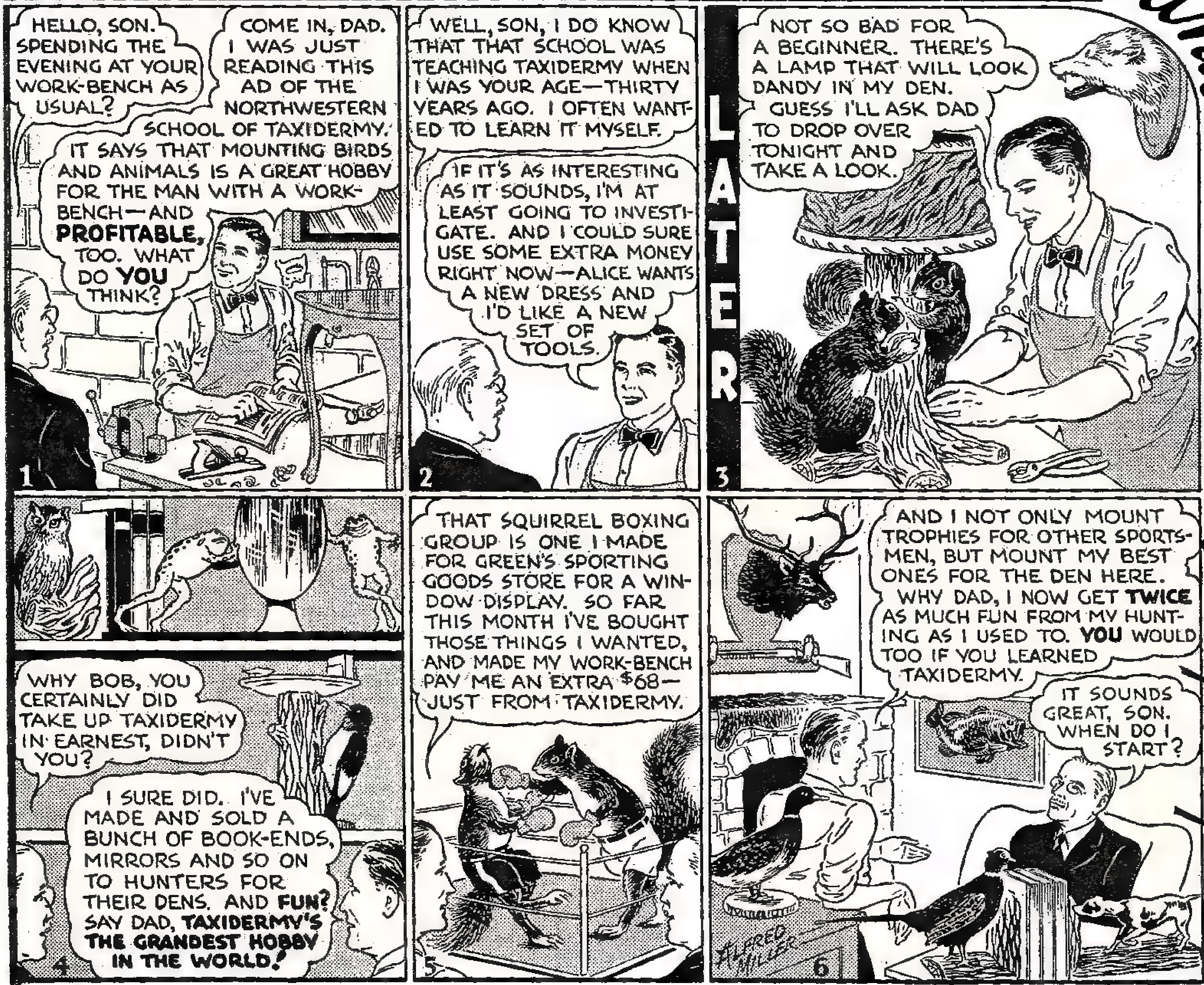
HOOPS FOR CANOES

In the Aug. issue of your magazine, there was an article on a Desert Town Canoe. We are interested in constructing one and in fact have nearly all materials collected, with the exception of the barrel hoops, which we are unable to get in our town. Could you advise us where we could get them or what else we could use that would be as inexpensive?—L.C.,Jr., Mitchell, S. D.

Ordinary oak slats can be gotten out to barrel stave size and then bent to any shape you want by merely putting them in a pot full of boiling water, letting them soak for a few minutes and then rapidly bending them while they are still hot.

(Continued on page 18)

Learn to Mount Birds and Animals—Send Coupon for Free Book!


HELLO, SON. SPENDING THE EVENING AT YOUR WORK-BENCH AS USUAL?
COME IN, DAD. I WAS JUST READING THIS AD OF THE NORTHWESTERN SCHOOL OF TAXIDERMY. IT SAYS THAT MOUNTING BIRDS AND ANIMALS IS A GREAT HOBBY FOR THE MAN WITH A WORK-BENCH—AND PROFITABLE, TOO. WHAT DO YOU THINK?
1
WELL, SON, I DO KNOW THAT THAT SCHOOL WAS TEACHING TAXIDERMY WHEN I WAS YOUR AGE—THIRTY YEARS AGO. I OFTEN WANTED TO LEARN IT MYSELF.
IF IT'S AS INTERESTING AS IT SOUNDS, I'M AT LEAST GOING TO INVESTIGATE. AND I COULD SURE USE SOME EXTRA MONEY RIGHT NOW—ALICE WANTS A NEW DRESS AND I'D LIKE A NEW SET OF TOOLS.
2
LATER
NOT SO BAD FOR A BEGINNER. THERE'S A LAMP THAT WILL LOOK DANDY IN MY DEN. GUESS I'LL ASK DAD TO DROP OVER TONIGHT AND TAKE A LOOK.
3
WHY BOB, YOU CERTAINLY DID TAKE UP TAXIDERMY IN EARNEST, DIDN'T YOU?
I SURE DID. I'VE MADE AND SOLD A BUNCH OF BOOK-ENDS, MIRRORS AND SO ON TO HUNTERS FOR THEIR DENS. AND FUN? SAY DAD, TAXIDERMY'S THE GRANDEST HOBBY IN THE WORLD!
4
THAT SQUIRREL BOXING GROUP IS ONE I MADE FOR GREEN'S SPORTING GOODS STORE FOR A WINDOW DISPLAY. SO FAR THIS MONTH I'VE BOUGHT THOSE THINGS I WANTED, AND MADE MY WORK-BENCH PAY ME AN EXTRA $68—JUST FROM TAXIDERMY.
5
AND I NOT ONLY MOUNT TROPHIES FOR OTHER SPORTSMEN, BUT MOUNT MY BEST ONES FOR THE DEN HERE. WHY DAD, I NOW GET TWICE AS MUCH FUN FROM MY HUNTING AS I USED TO. YOU WOULD TOO IF YOU LEARNED TAXIDERMY.
IT SOUNDS GREAT, SON. WHEN DO I START?
ALFRED MILLER
6

Fun–Fascination–Profits

Be a Taxidermist. All Secrets Revealed. Learn at Home

Save Your Hunting Trophies

Mount (stuff) expertly your valuable **game-birds, animals, fish, game-heads.** Preserve them just like **life.** That is Taxidermy. Learn at home by **mail.** Decorate home and den with nature's art. Make undreamed-of **profits** in spare time, in your shop. You can. Will you? Win fame as a taxidermist. Investigate. Mail **coupon** NOW.

Success Guaranteed

This old reliable school has graduated 200,000 students in Taxidermy. 30 years in business. Our great success permits this **guarantee.** We **know** we can teach **you.** It's a grand money-making **hobby.** You **must** be interested, if you hunt or fish or have a work-shop. **Ask** for the **free book** and learn all about Taxidermy.

Wild Game Not Needed

Use **common** specimens; squirrels, rabbits, chicks, pets, owls, pigeons—even frogs. Make useful articles like those shown here. Mount them in human and humorous positions. This is craft and novelty taxidermy. It's **fun**—and **profitable.** All included in our unique lessons. It's **marvelous.** Write the school this minute.

BIG PROFITS From Your Shop in Spare Time

Many students earn from $40 to $75 monthly in spare time. Some earn thousands of dollars each year. Sportsmen bring their trophies to be mounted. Besides you can sell your own **Novelty** groups for homes, dens and for merchants' window display.

LEARN TANNING

The lessons teach tanning harness, sole, crome leather; also furs. Expert methods. **Very profitable.**

Mail Coupon

Or a postcard will do. No obligation on your part. The beautiful **Book,** with hundreds of entrancing **Pictures** is **Free.** Don't miss your **Only Chance** to get this remarkable book **Free and Postpaid.** Write today. State your **Age.**

Northwestern School of Taxidermy
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FREE BOOK

MOUNT your own Trophies

Northwestern School of Taxidermy,
4732 Courtney Bldg., Omaha, Neb.

Gentlemen: Please send at once, your free 48-page book on Taxidermy without any obligation on my part. Tell me how I can learn Scientific Taxidermy at home.

Name.. *Age*.........

Address..

Attention

MEN WHO WANT TO GET MARRIED!

Most likely your income has been reduced. And yet —

You and that girl of your dreams have the precious hope of facing life together!

The obstacle is money — more money.

Listen: Thousands of men, even in these times—men who faced the same problem that now troubles you—have learned the *secret.* They're making themselves more valuable on their present jobs, preparing themselves for the bigger opportunities ahead!

They're doing it by devoting a portion of their spare time to study—by mastering International Correspondence Schools Courses that are modern and practical in their training. Many of today's business leaders started this very way.

You can do the same thing—and realize *that* hope you hold so dear. It takes work and sacrifice—what worth-while thing doesn't? The coupon will bring you good news—mail it today!

INTERNATIONAL CORRESPONDENCE SCHOOLS

"The Universal University" **Box 2316-V, Scranton, Penna.**

Without cost or obligation, please send me a copy of your booklet, "Who Wins and Why," and full particulars about the subject before which I have marked X:

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☐ Architect
☐ Architectural Draftsman
☐ Building Estimating
☐ Wood Millworking
☐ Contractor and Builder
☐ Structural Draftsman
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☐ Electrical Engineer
☐ Electric Lighting
☐ Welding, Electric and Gas
☐ Reading Shop Blueprints
☐ Telegraph Engineer
☐ Telephone Work
☐ Mechanical Engineer
☐ Mechanical Draftsman
☐ Machinist ☐ Toolmaker
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☐ Aviation Engines
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☐ Air Conditioning
☐ Sheet Metal Worker
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☐ Lumber Dealer

Name..Age...............

Address..

City......................................State...

Occupation..

If you reside in Canada, send this coupon to the International Correspondence Schools Canadian, Limited, Montreal, Canada

Problems

(Continued from page 16)

A BOAT FOR SMALL ENGINE

I have an 8 H.P. Lockwood-Ash marine motor and would like to know if you have any boat designs that would be suitable to be powered by it. I would like to build a boat very much like "Scram," "Wink," or "Doane's Hydrobout." I have read "How to Build 20 Boats" from cover to cover and it made me a boat bug for sure.—B.A.J., Rock Valley, Iowa.

Your eight horse Lockwood-Ash motor would not drive Scram, Wink or Doane's Hydrobout at over eight miles an hour. To get twenty miles you would have to have a very light outfit.

* * *

TROUBLE WITH SHORT WAVES

I built a short wave set like the one shown in March, 1933, Modern Mechanix, but it will not whistle or squeal, and gets only two stations. I have the tube inside the set, otherwise everything was made according to the plans.—E.P.H., Berkeley, Calif.

Increasing the coupling of the coils by moving them closer together on the form, or even overlapping them a bit, should solve your regeneration troubles.

Be sure the different parts of the set are shielded and grounded as specified in the plans. If a metal shield around the tube will not give satisfactory operation, it will be necessary for you to put the tube outside the set, as specified in the plans.

* * *

WET CELLS FOR "B" SUPPLY

I have a six tube battery radio which requires two 45 volt "B" batteries in series. These are a considerable expense, so I would like to build a "wet" battery of sufficient voltage to handle this set.

Could standard storage battery plates be cut into three parts, and placed in large medicine bottles for small cells? Would using three plates be better than just one positive and one negative plate? How many cells would be necessary for 90 volts?

Could the cells be arranged so that they could be charged with six volt equipment?

Does the volume of acid per cell matter? Will the acid have the same specific gravity in small or large cells?

Will the reduced size of plates give satisfactory operation on my radio?—F.W., Abbotsford, British Columbia, Canada.

Of course, it is possible to construct a 90 volt wet battery as you suggest, using 45 separate cells, if you have the time, the ambition, and the necessary storage battery plates.

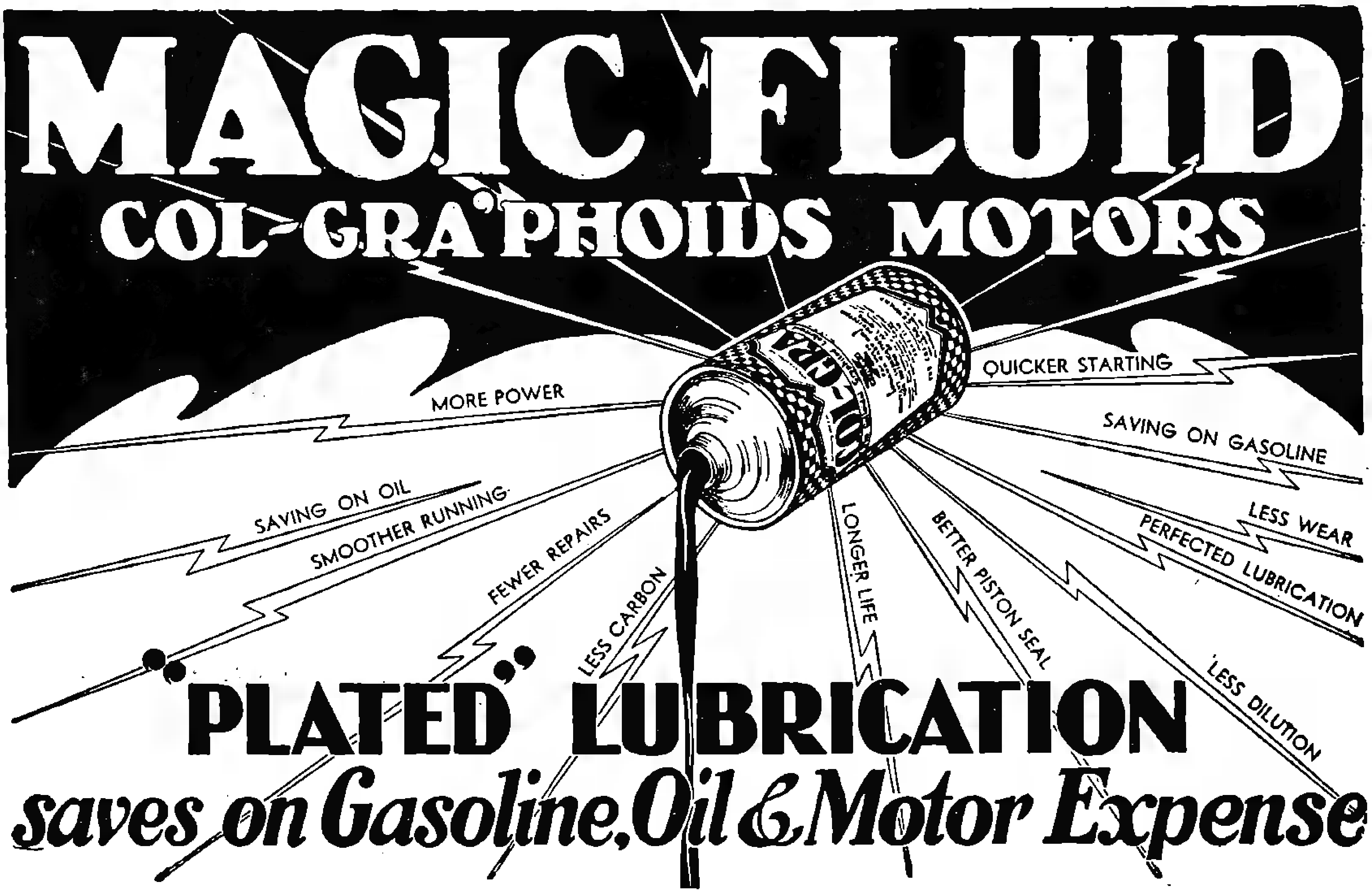
It is possible to rig up a switching arrangement whereby cells can be charged with a six volt charger. The cells would have to be changed over from the series connection to a parallel combination of groups of three cells for this.

The capacity of a storage battery depends upon the number of pairs of plates and the area of each plate. Two pairs of plates per cell should be about right for your purpose, for the drain upon plate supply batteries is relatively small.

The acid should of course completely cover the plates. It will have the same specific gravity as in an ordinary storage battery.

MAGIC FLUID

COL-GRA'PHOIDS MOTORS



"PLATED" LUBRICATION

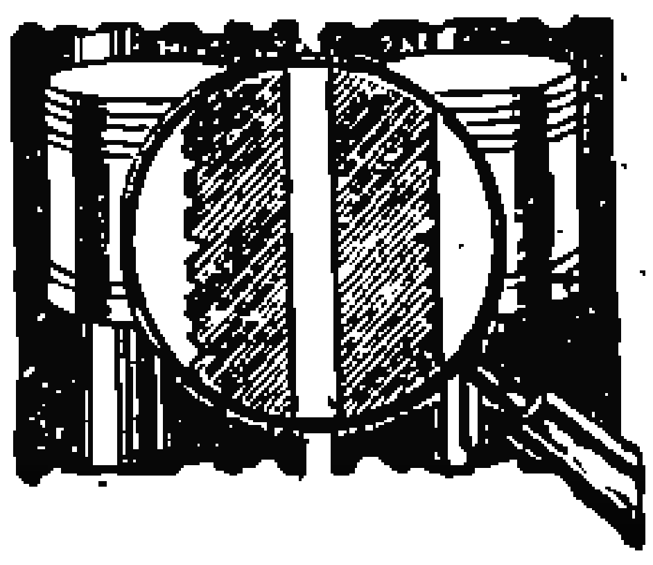
saves on Gasoline, Oil & Motor Expense

AUTOMOBILE, Airplane, Tractor, Truck and Machinery Owners! Think of it! A revolutionary discovery now "plates" lubrication on all moving parts. Automobile owners, airplane pilots, engineers and other Col-gra users, are amazed at its action. "Like Magic" is the best description of it.

REVOLUTIONARY DISCOVERY

Added to the oil and gasoline, Col-gra seeks all friction parts, where under heat, speed and pressure, it quickly forms an almost **frictionless Col-gra'phoid surface.** This means smoothness—quicker acceleration—amazing savings on gas, oil and repairs. Col-gra's patented ingredients manufactured at 7500° assure positive lubrication. No motor heat too great. No temperature too cold. Gasoline cannot wash it off. It stays put!

PROVEN BY TESTS



On a recent test of a Col-gra'phoided motor, four engineers ran an automobile, without the slightest motor injury, for [redacted] miles without oil, proving beyond all doubt the ability of this surface to lubricate even in the **complete absence of oil.** Laboratory tests further show the amazing difference between treated and untreated friction surfaces.

SALESMEN AND DISTRIBUTORS

Good Territory Open

Col-gra is sold by filling stations, garages and car dealers all over the country. Appointed distributors and their salesmen contact these dealers as jobbers in assigned territory. Men with automotive experience or proven sales experience in other lines needed to take over valuable territories which are still open. An unusual opportunity and a permanent connection. For further information check and mail the coupon.

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Dept. 1514, 2621 N. 3rd St., Milwaukee, Wis.

PAYS FOR ITSELF

Because Col-gra reduces friction, gives more power, frees valve action, reduces carbon, heat and wear, and prevents bare metal-to-metal friction, it gives motorists many added miles with less cost. Col-gra quickly pays for itself many times over in savings on repairs, motor fuel, oil, starter and battery.

MORE POWER - PEP - SPEED

Col-gra users everywhere are enthusiastic. "I am pleased with results," writes Frank Eastwood. "The motor's smoothness is almost beyond belief. My mechanic says it can't be the same engine." Paul Canalizon: "Col-gra gives the car more power—speed—pep and gas mileage." W. P. Barrows: "My car runs much smoother, uses less oil and has more pep." E. C. Bergman: "Col-gra helps the motor a whole lot—is working more freely and less vibration."

WRITE FOR FREE BOOKLET

Every car owner—every user of machinery of any kind should know about Col-gra "Plated" lubrication. Go to your dealer and ask for 32 page illustrated Col-gra booklet, or mail the coupon below and obtain this 32 page booklet free.

FREE OFFER COUPON!

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Gentlemen: Please send me full particulars together with your free 32 Page Illustrated Booklet. This does not obligate me in any way.

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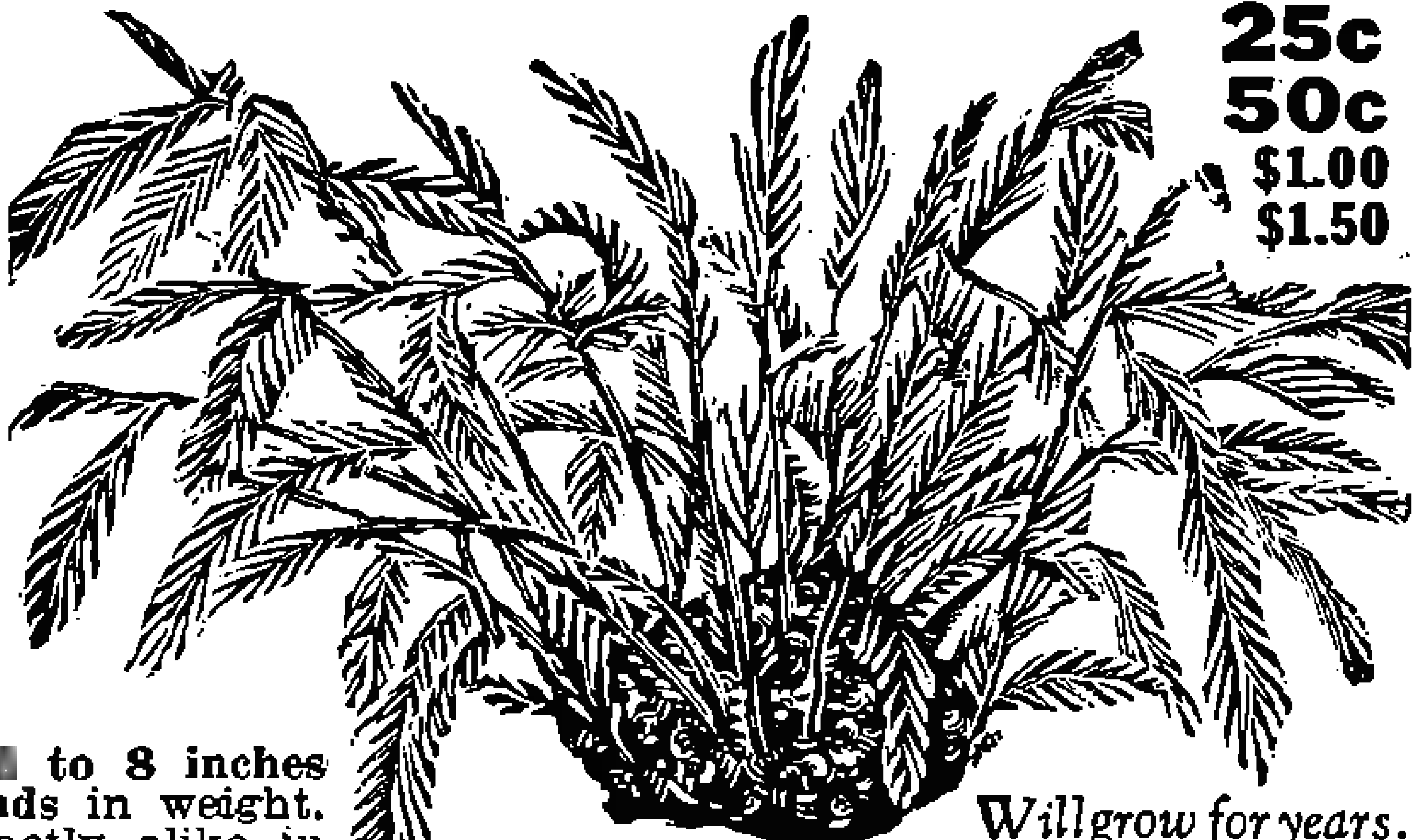
☐ Check here if interested for your own car only.
☐ Check here if interested in Distributor's position.

CALIFORNIA REDWOOD BURLS

A Very Charming Horticultural Novelty



Will grow for years.

PLACE IT IN WATER—WATCH IT GROW

This Burl is a growth of the famous **CALIFORNIA GIANT REDWOOD TREE** and when removed from the tree and placed in a bowl, in about one-half inch of water, it starts growing and sends forth the **BEAUTIFUL REDWOOD TREE FOLIAGE** and brings the **FRAGRANCE OF THE WOODS** into your home. Changing the water once a week and being careful they do not dry out is all the attention they need. You will enjoy watching them grow. As a house plant they have no equal. They are extremely hardy and will grow for years anywhere. They do not need any sun. The one illustrated is two years old.

The Burls are graded and sold according to size and thickness. **The smallest size** is about [illegible] inches long, weighs about 4 ounces and sells for 25c. The next size sells for **50c** and is somewhat **larger** and **thicker.** The **next size** is **still larger** and sells for **$1.00.** The **Largest size** at **$1.50** is quite **thick and heavy,** is [illegible] to 8 inches long by about [illegible] inches thick and averages about 2 pounds in weight. We cannot give exact measurements as no two are exactly alike in size or shape. **Shipped prepaid. Johnson Smith & Co., Dept. 719 Racine, Wis.**

MAKEYOUROWNRADIO

Enjoy the concerts, baseball games, market reports, latest news, etc. This copyrighted book "EFFICIENT RADIO SETS" shows how to make and operate inexpensive Radio Sets; the materials for which can be purchased for a mere trifle. Also tells how to build a short-wave Receiver for bringing in foreign stations; police calls, ships [illegible] sea, etc. **ONLY 15c p.pd.**

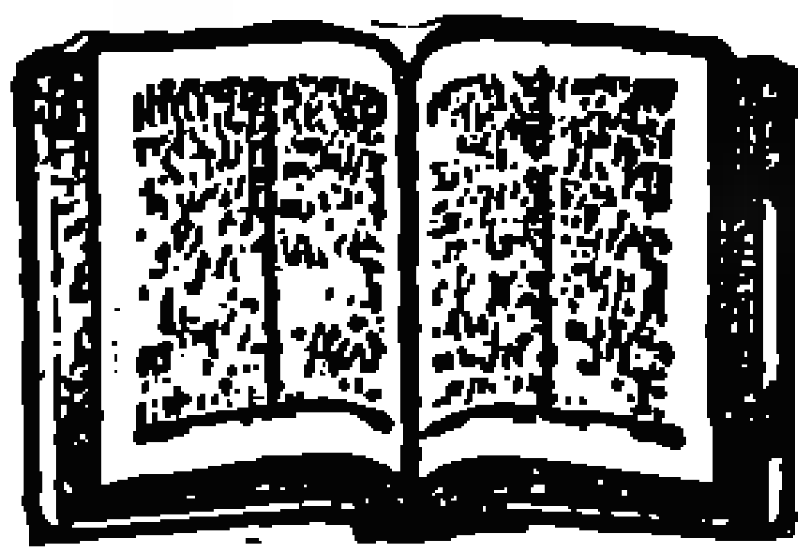
250 MAGIC TRICKS

MAGIC MADE EASY

An excellent little book containing nearly 300 tricks for parlor or stage that anyone can do. Tricks with cards, coins, handkerchiefs, eggs, bottles, string, etc. Also Second Sight, Shadowgraphy, etc. Profusely illustrated. **10c postpaid.**

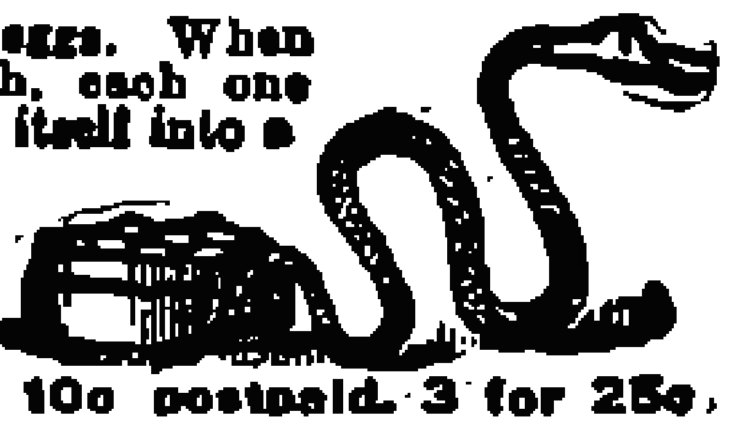
125 CARD TRICKS and sleight of hand. Contains all the latest and best card tricks as performed by celebrated magicians, with exposure of card tricks used by professional gamblers. **Price 25c postpaid.** Coin or stamps.

MIDGET BIBLE



GREAT CURIOSITY Smallest Bible in the World. Size of a postage stamp. 200 Pages. Said to bring good luck to the owner. A genuine work of art. Must be seen to be appreciated. Make good money selling them to friends, church acquaintances, etc. PRICE 15c each. 3 for 40c, 12 for $1.35, 100 for $7.50. Also obtainable in Leather Binding, with gold edges. Price 50c each, 3 for $1.25, $4.50 per doz. Magnifying Glass for use with Midget Bible 15c

SERPENT'S EGGS

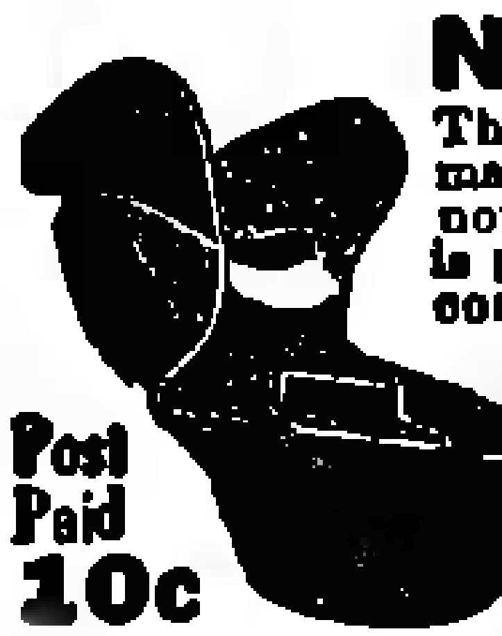


Box contains 12 eggs. When [illegible] with a match, each one gradually hatches itself into a snake several feet long, which curls and twists about in a most life-like manner. **Price per box. 10c postpaid. 3 for 25c.**

STAGE MONEY

With a bunch of these bills, it is easy for each person of limited means to appear prosperous by flashing a roll of these bills at the proper time and peeling off a genuine bill or two from the outside [illegible] the roll, the effect created will be found to be all that can be desired. **Prices, postpaid: 40 Bills 20c, 120 for 50c, or $3.50 thousand postpaid.**

NOSE FLUTE



Post Paid 10c

The Magic Nose Flute, or Humanatone, [illegible] a unique and novel musical instrument that is played with nose and mouth combined. There is just a little knack in playing it which, when once acquired after a little practice, will enable you to produce very sweet music that somewhat resembles a flute. There [illegible] no fingering, and once you have mastered it you can play all kinds of music with facility and ease.

JOHNSON SMITH & CO.

SURPRISE MATCHES

More fun than fighting with your wife. Look just like ordinary matches. As the victim tries to light one he gets quite a surprise.

Price 10c per box, 3 boxes for 25c, 12 for 75 cents.

STAR TOY MAKER

Greatest boys' book written. Tells how to make a Pinhole Camera, a Canoe, model Railroad, a Telephone, Boomerang, Telegraph Instrument, Box Kite, Talking Machine, Microscope, Electric Motor, Electric Door Bell, Water Wheel, Paddle Raft, a pair of Skis, a Dog Sled, Bird House, Rabbit Yard, etc. 64 pages. 150 Illustrations. **PRICE 10c.**

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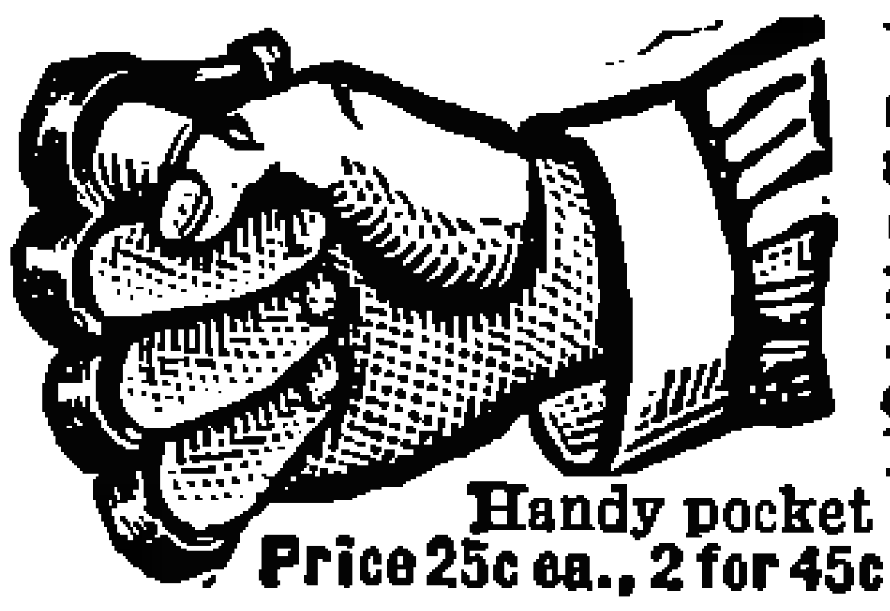

Used by police officers, detectives, sheriffs, night watchmen and others as a means of self-protection. Very effective. Easily fits the hand, the fingers being grasped in the four holes. Very useful in an emergency. Made of aluminum they are very light, weighing less than 2 ounces. Handy pocket size always ready for instant use. **Price 25c ea., 2 for 45c postpaid.** ***770 page Catalog 10c.***

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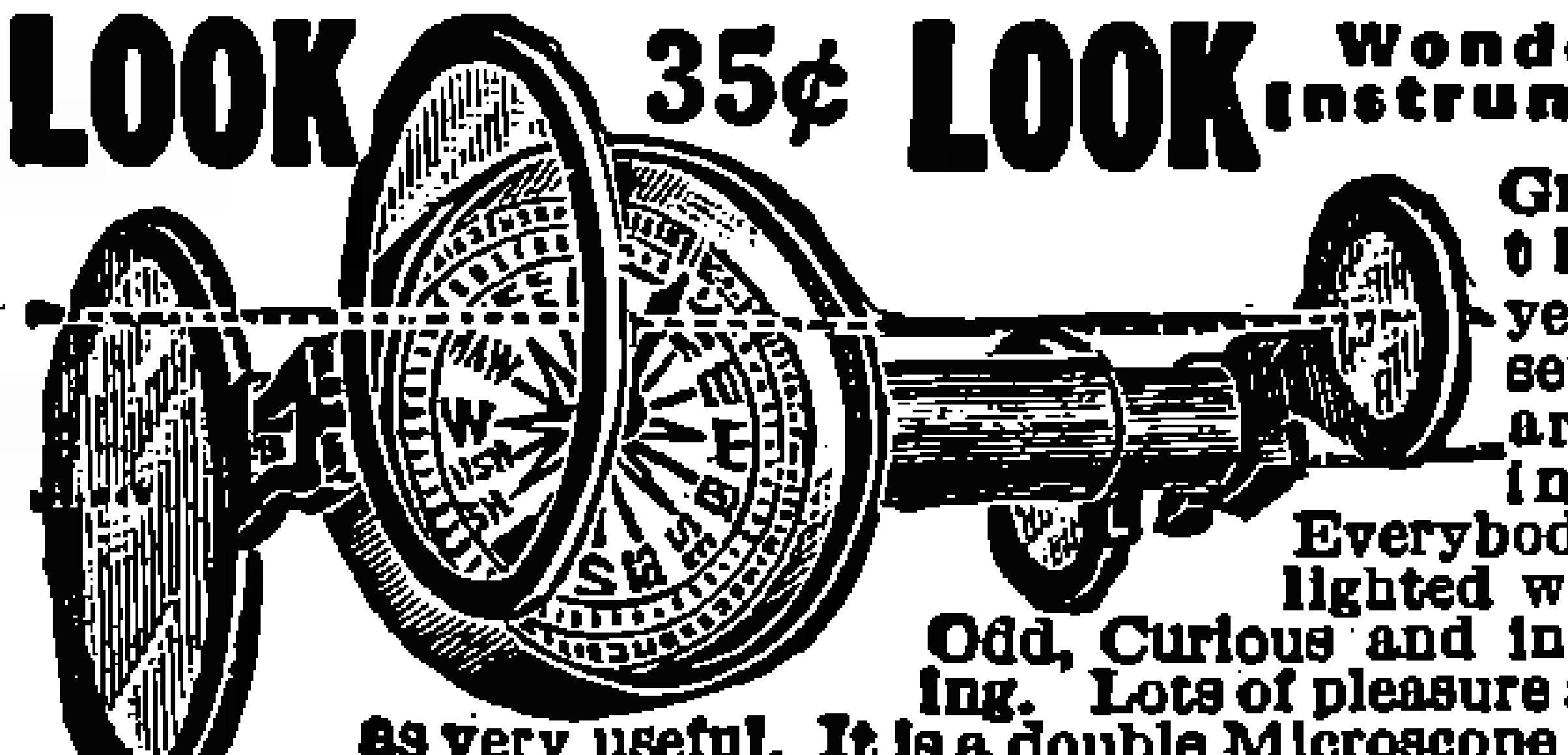

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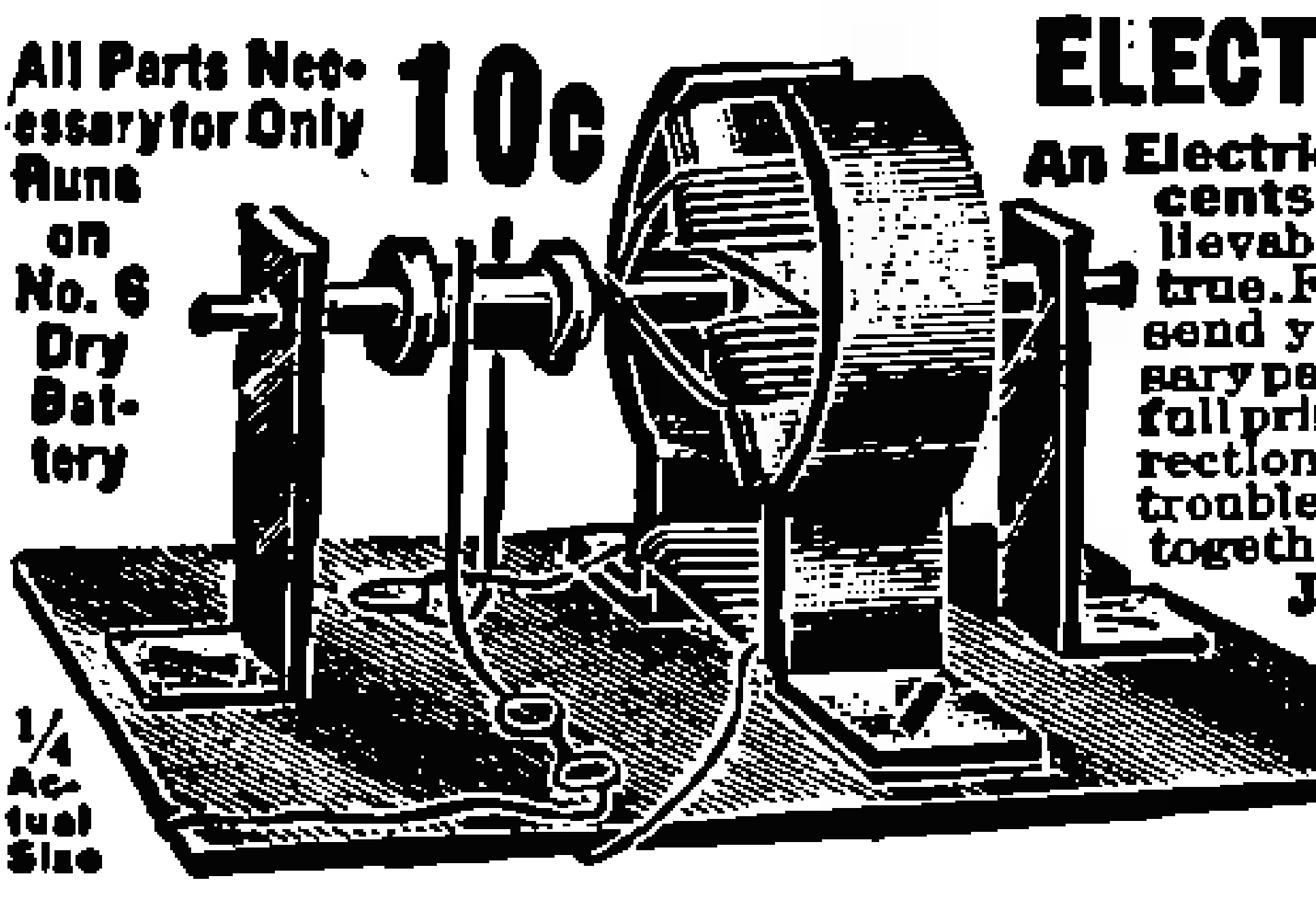
All Parts Necessary for Only
10c
Runs on No. 6 Dry Battery
1/4 Actual Size

An Electric Motor for Only 10 cents. Sounds almost unbelievable, but it is perfectly true. For ONLY **10 cents** we send you all the parts necessary packed in a neat box with full printed and illustrated directions for assembling. No trouble at all putting the parts together in fact it is FUN. Just follow a few simple instructions and in a few minutes the motor is ready to run.

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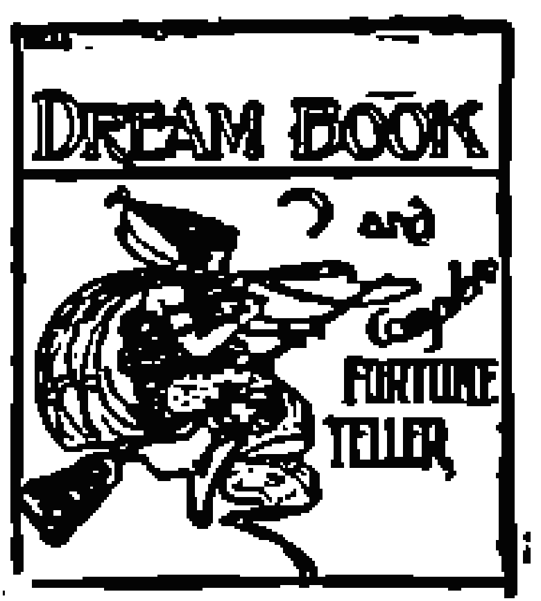

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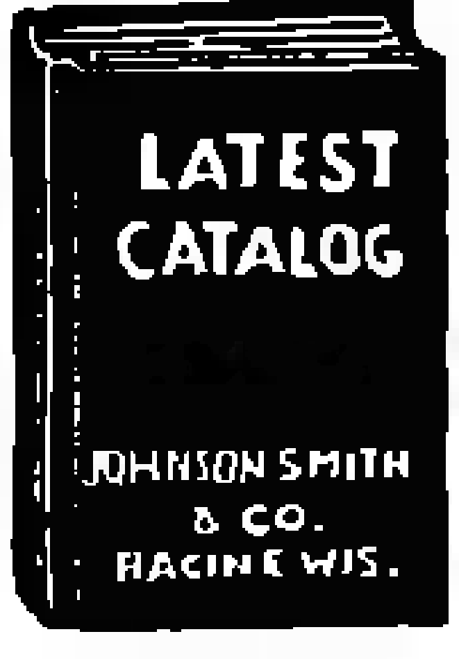
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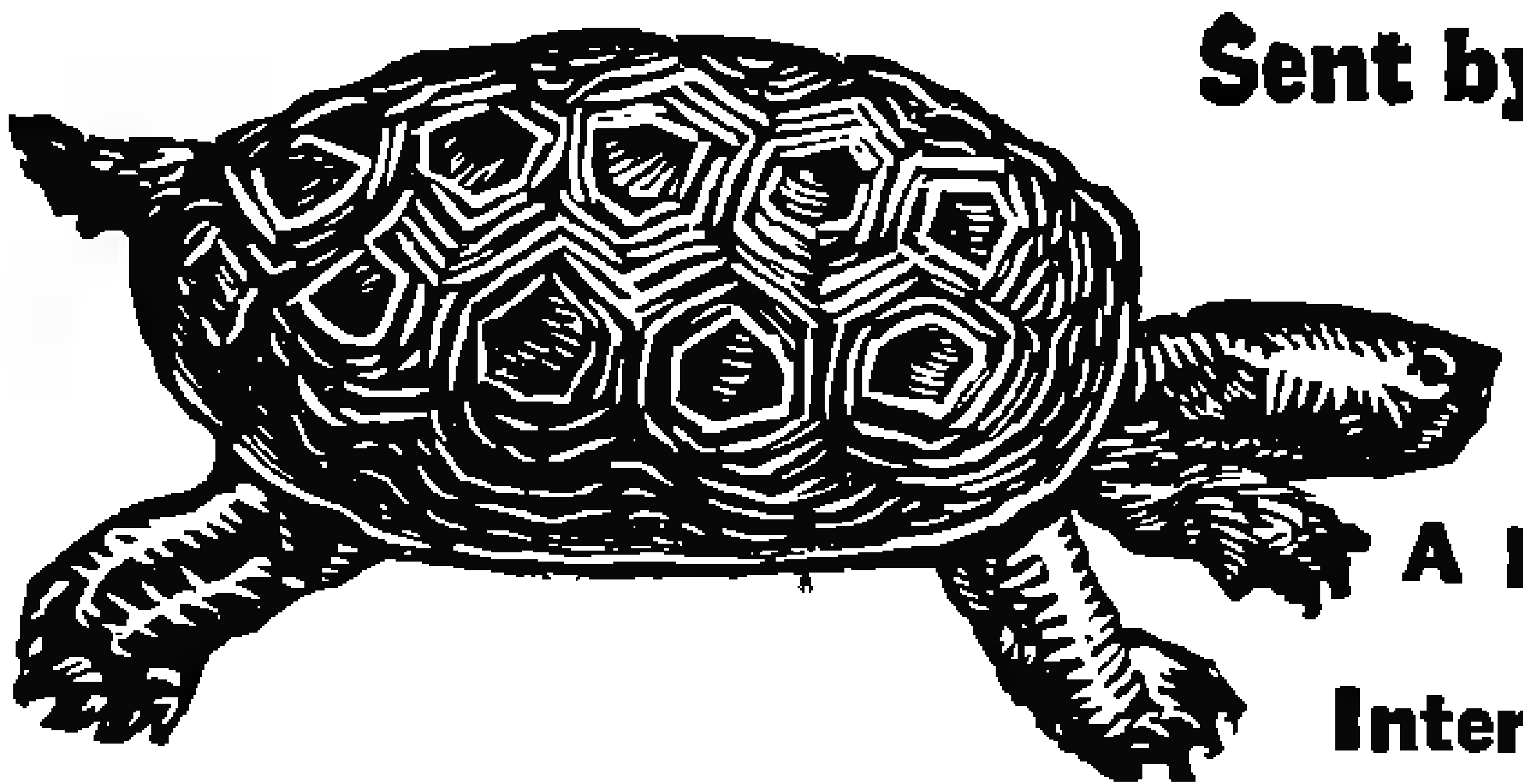

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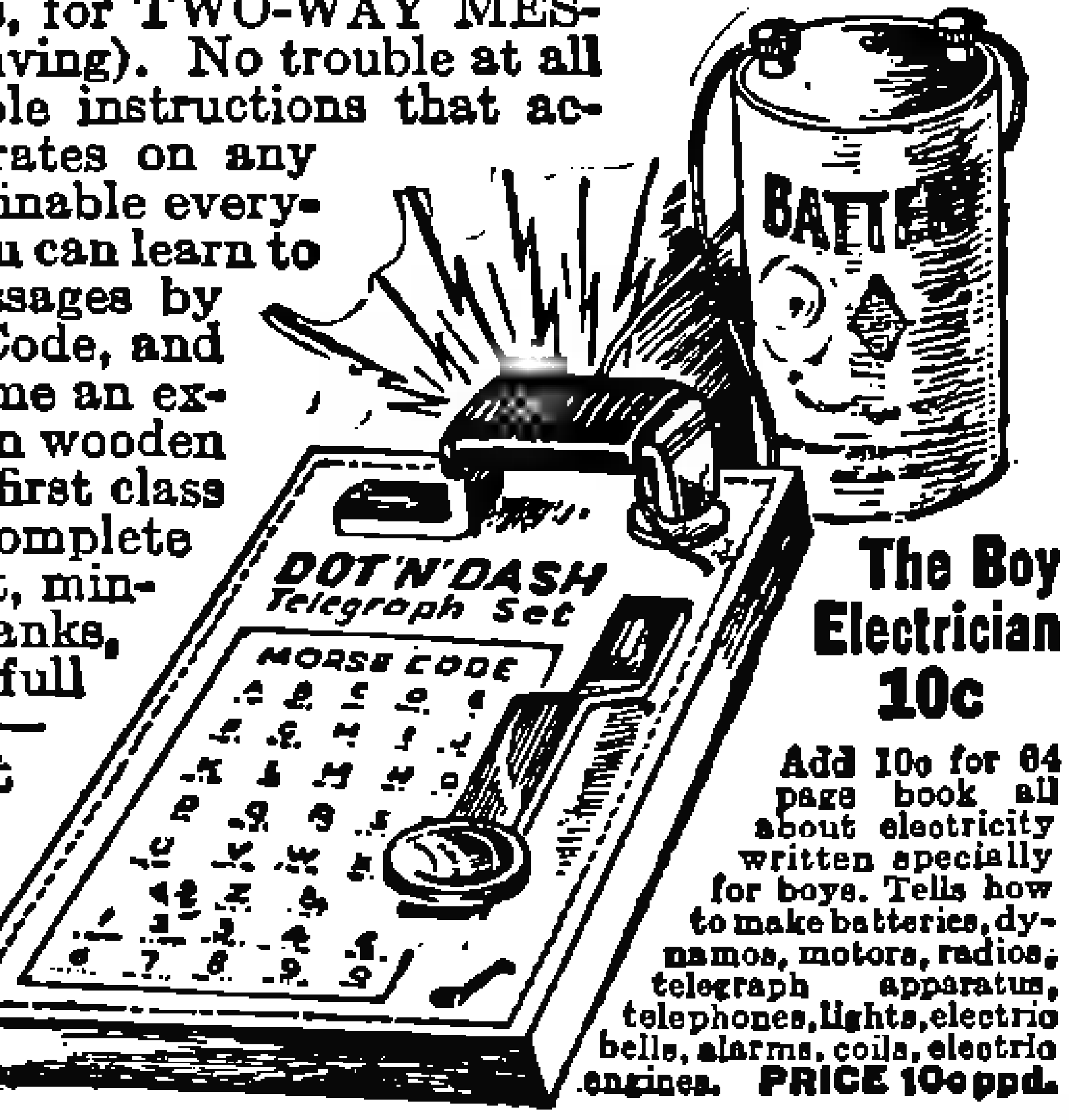

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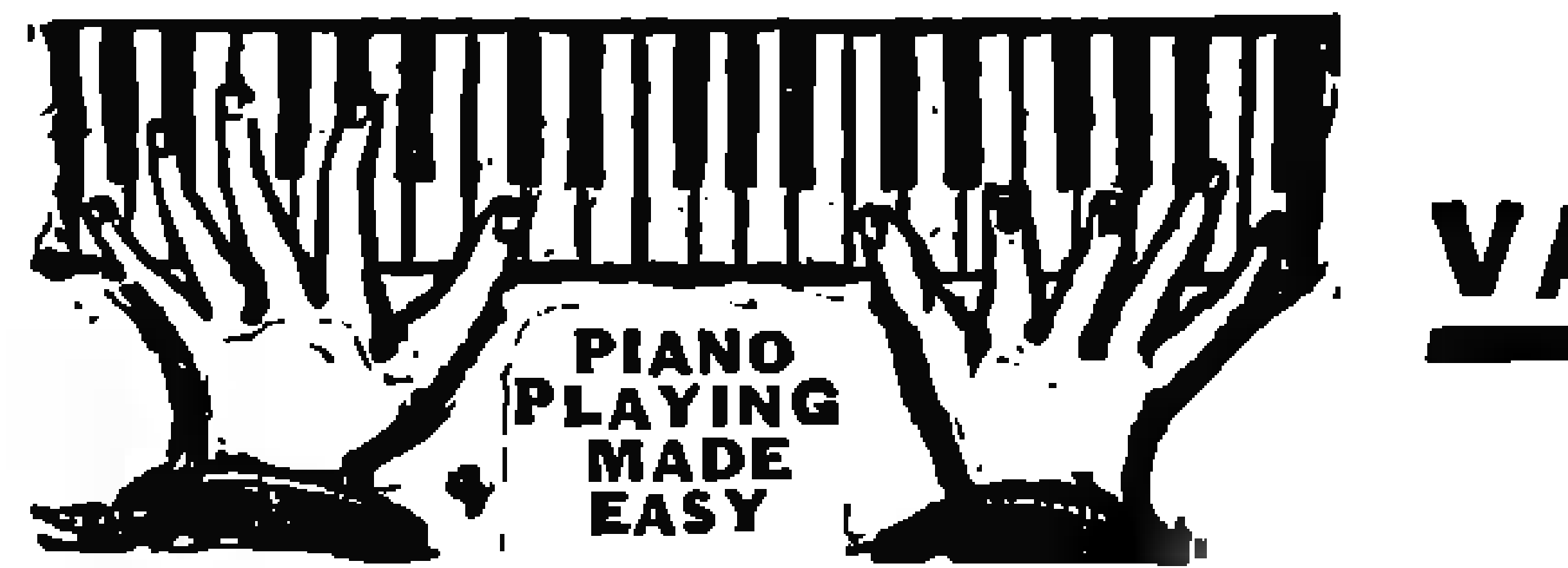

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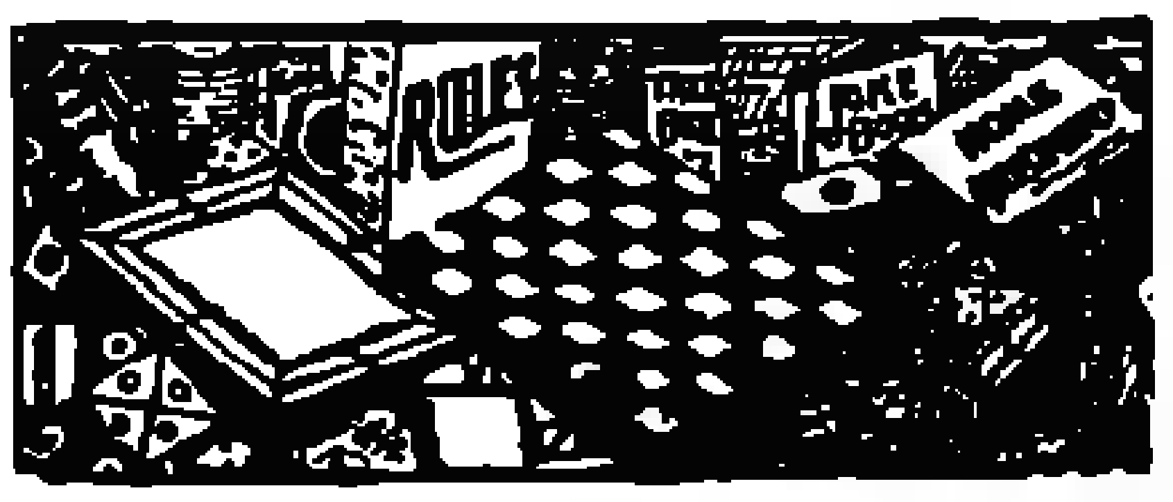
FUN, MAGIC and MYSTERY



326 Jokes and Riddles, 25 Magic Tricks, 10 Parlor Games, 73 Toasts, 13 Fairy Tales, 105 Money-making Secrets, 22 Monologues, 21 Puzzles and Problems, [illegible] Comic Recitations, 10 Funny Readings, 11 Parlor Pastimes, 13 Flirtations, 1110 Girls and Boys Names and their Meanings, 10 Picture Puzzles, 69 Amusing Rhymes, 37 Amusing Experiments, Deaf and Dumb Alphabet, Shadowgraphy, Gypsy Fortune Teller, How to tell Fortunes with Cards, Dice, Dominoes, Crystal, Coffee Cup, etc., Hypnotism, Ventriloquism, Cut-outs for Checkers and Chess, Dominoes, Fox and Geese, 9 Men Morris, Spanish Prison Puzzle, Game of Anagrams, [illegible] Card Tricks, Crystal Gazing etc. **ALL FOR 15 CENTS POSTPAID**

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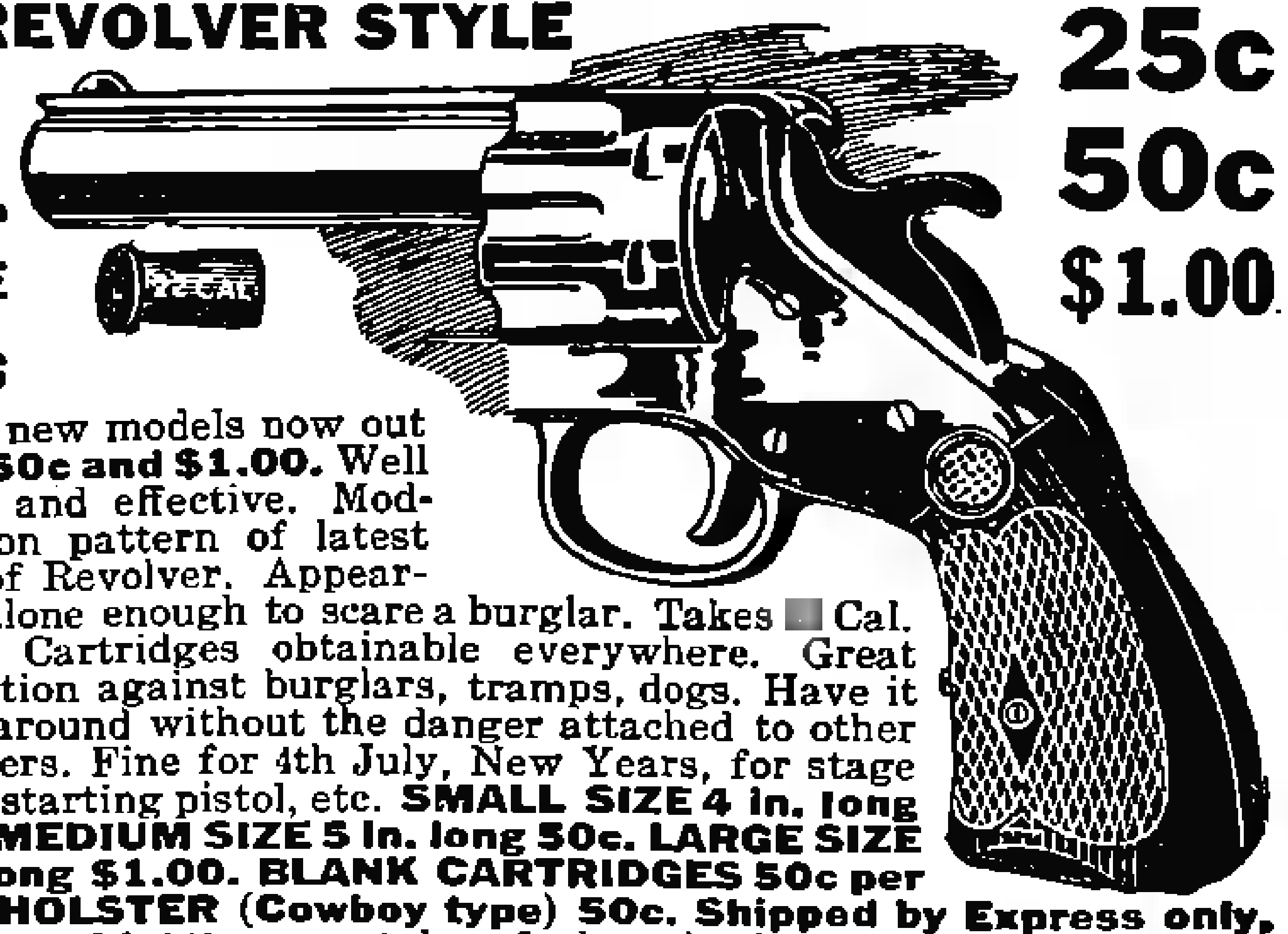
Blank Cartridge Pistol

REVOLVER STYLE

.22 CAL.

25c 50c $1.00

MADE IN 3 SIZES



Three new models now out **25c, 50c and $1.00.** Well made and effective. Modelled on pattern of latest type of Revolver. Appearance alone enough to scare a burglar. Takes [illegible] Cal. Blank Cartridges obtainable everywhere. Great protection against burglars, tramps, dogs. Have it lying around without the danger attached to other revolvers. Fine for 4th July, New Years, for stage work, starting pistol, etc. **SMALL SIZE 4 in. long 25c. MEDIUM SIZE 5 in. long 50c. LARGE SIZE 6in. long $1.00. BLANK CARTRIDGES 50c per 100. HOLSTER (Cowboy type) 50c. Shipped by Express only, not prepaid.** *710 page catalog of other pistols, sporting goods, etc. 10c*

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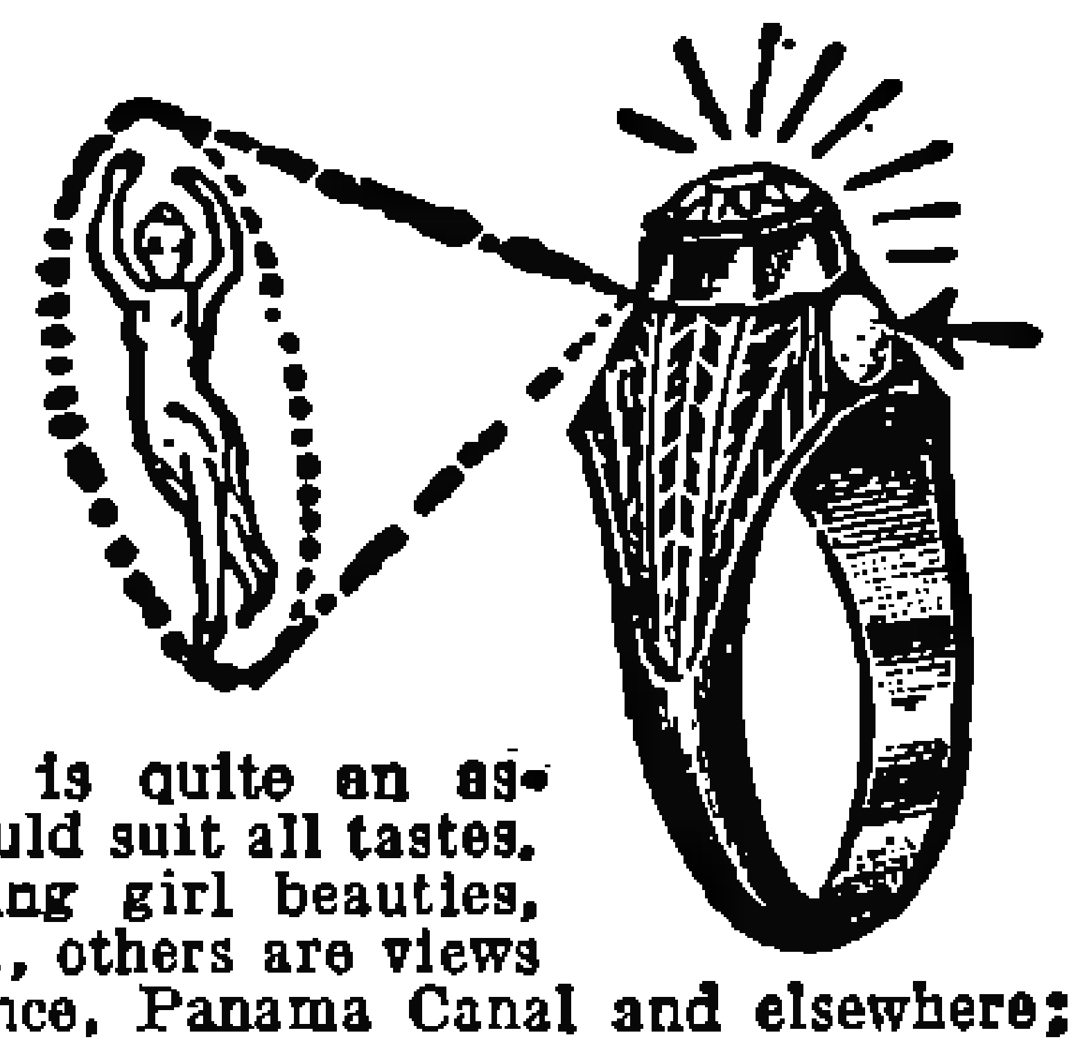

Here [illegible] a very great novelty in Rings, that is selling in thousands. It is a nicely made ring, finished in imitation platinum, and set with a large imitation diamond. It looks just like an ordinary ring, but in the shank of the ring is a small microscopic picture almost invisible to the naked eye, yet is magnified to an almost incredible degree and with astonishing clearness. There is quite an assortment of pictures that should suit all tastes. Some are pictures of bathing girl beauties, pretty French Actresses, etc., others are views of places of interest in France, Panama Canal and elsewhere; others show the Lord's Prayer in type, every word of which can be read by persons with normal eyesight. They are interesting without being in any way objectionable. **PRICE 25c, 3 for 65c, or $2.25 per doz. postpaid.** *7/0 page Catalog 10c.*

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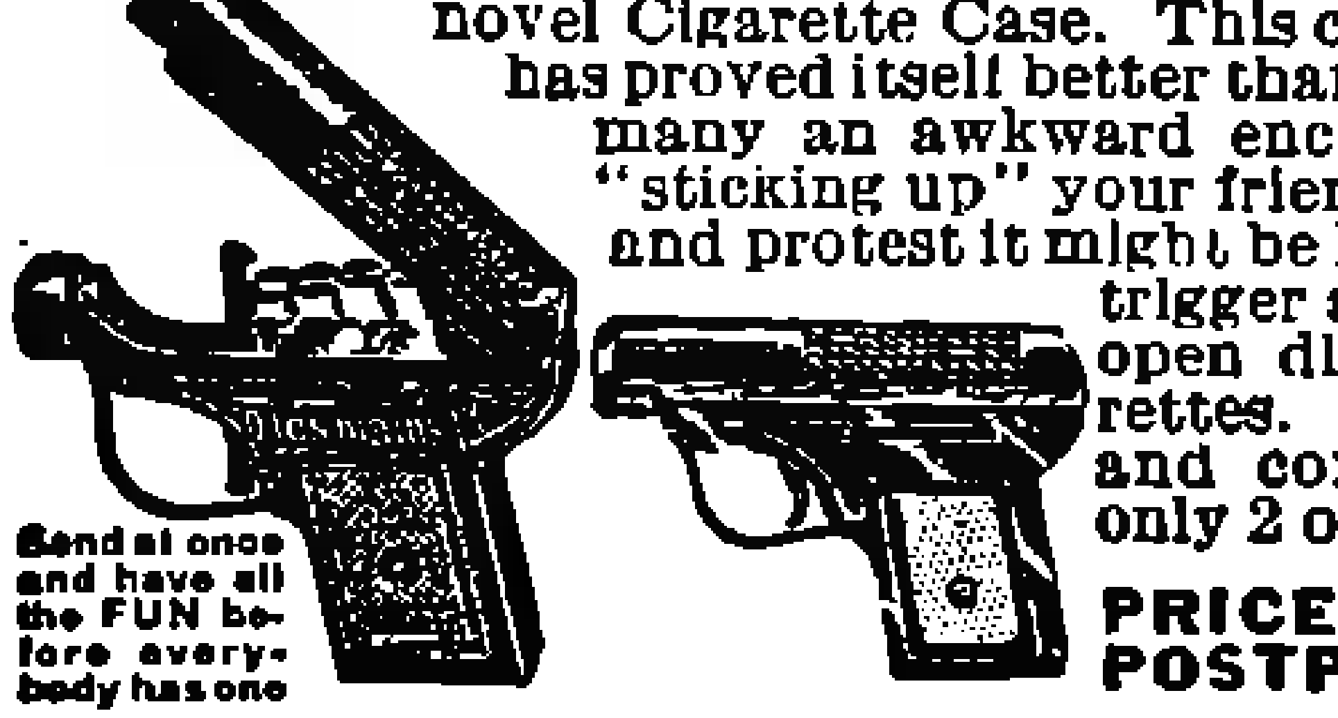

Send at once and have all the FUN before everybody has one

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PRICE POSTPAID 25c

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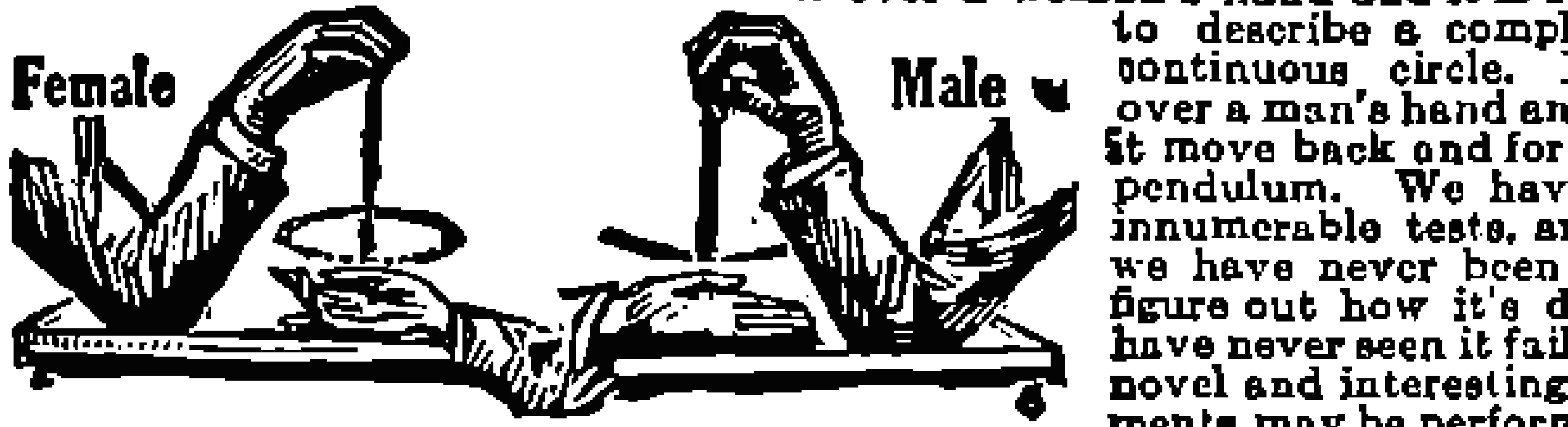
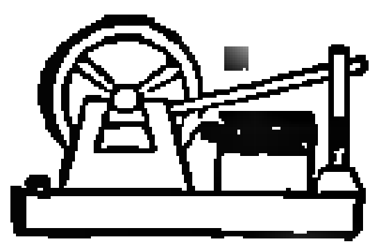


An amusing and entertaining novelty. Hold it over a woman's hand and it is supposed to describe a complete and continuous circle. Hold it over a man's hand and watch it move back and forth like a pendulum. We have made innumerable tests, and while we have never been able to figure out how it's done, we have never seen it fail. Many novel and interesting experiments may be performed with it. Try it for testing the sex of animals, cats, dogs, rabbits, butterflies, etc. Sold as a patent egg tester in Europe. **PRICE 10c, 3 for 25c, 75c per doz. p-p.**



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Here is Mrs. C. P. Blalock in her Ford car that ran 51 miles on a gallon of gas.

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In an amazing test recently conducted by a Texas Motor Company, 23 cars were entered to determine mileage economy. The winning car, owned by Mrs. C. P. Blalock, pictured to the left, ran 51 miles on a gallon of gas, and the second car 49 miles on a gallon of gas. When official test records were published, it was found that both of these cars were equipped with Mr. Weeks' invention.

Emery Shaffer and Packard Limousine he drives.

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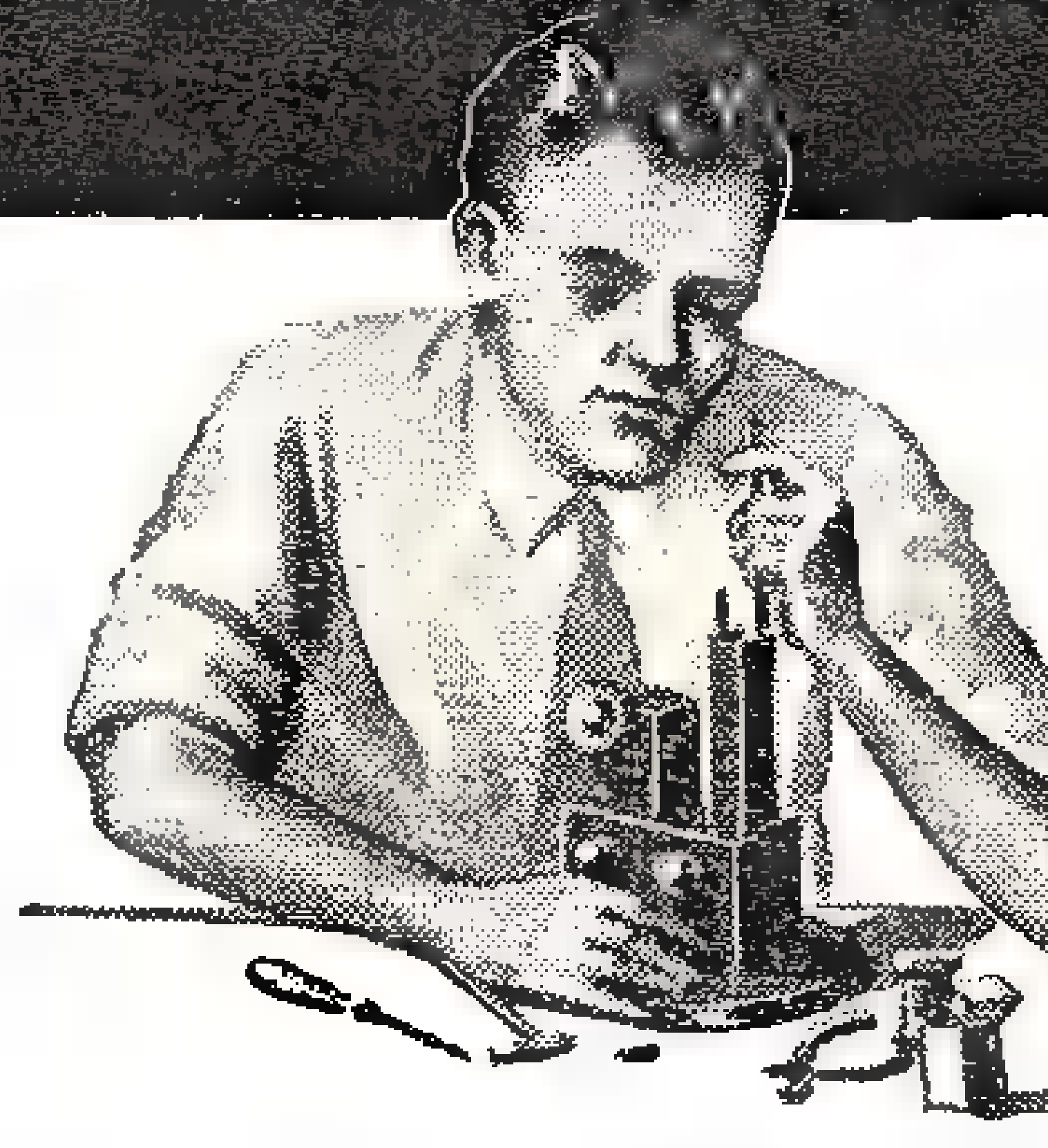
THE BOOK ON THE NEXT PAGE IS FOR INVENTORS AND OTHER MEN WITH IDEAS

SOME of the world's most successful inventions came from men who didn't consider themselves inventors at all. The telegraph was invented by a painter; the typewriter by a farmer; a poet figured out the sewing machine; a school teacher the telephone; a bank clerk the hand camera and a dentist the stock ticker. Or look at small inventions: A husband noticed his wife bending a hair pin to make it stay in her hair. That gave him the idea of the crinkly hair pin, which he proceeded to patent. One day a golfer got the idea—just a hunch—to make a wooden tee. He patented his idea—and every golfer knows that wooden tees are sold by the millions every year. These are but a few of many similar examples in inventive history.

That is why we say that the book shown on the next page is for INVENTORS and Other Men with IDEAS. Some men make a business of invention. They make their living—even fortunes—that way. Other men who are not inventors at all occasionally have good, practical ideas which could be patented to their profit and with benefit to the world.

Whether you consider yourself an inventor or not—if you have a good idea; an idea that will save money, save time, save labor, make money or give pleasure—you should at least find out how you can protect your rights to it. And this interesting, new FREE book, PROFIT PROTECTION, will tell you.



Read What C. F. KETTERING Vice-Pres., General Motors says about Invention

Sometimes we hear people say: "Well, there isn't must left to invent." But Charles F. Kettering, Vice President and Head of Research of General Motors, who helped develop the self-starter, Duco, and many other outstanding inventions, **doesn't think that at all.** He thinks just the opposite. In an interview recently published in Good Housekeeping Magazine, Mr. Kettering said:

"If we took half the men employed in tool making and put them to working out new inventions, new things, we could snap out of this depression in no time. Our return to normal times depends on new manufactured products that will catch the purchaser's eye, get him to buy and thus start the ball rolling. Change and buying go together. ***We're only entering the great period of inventive advancement."***

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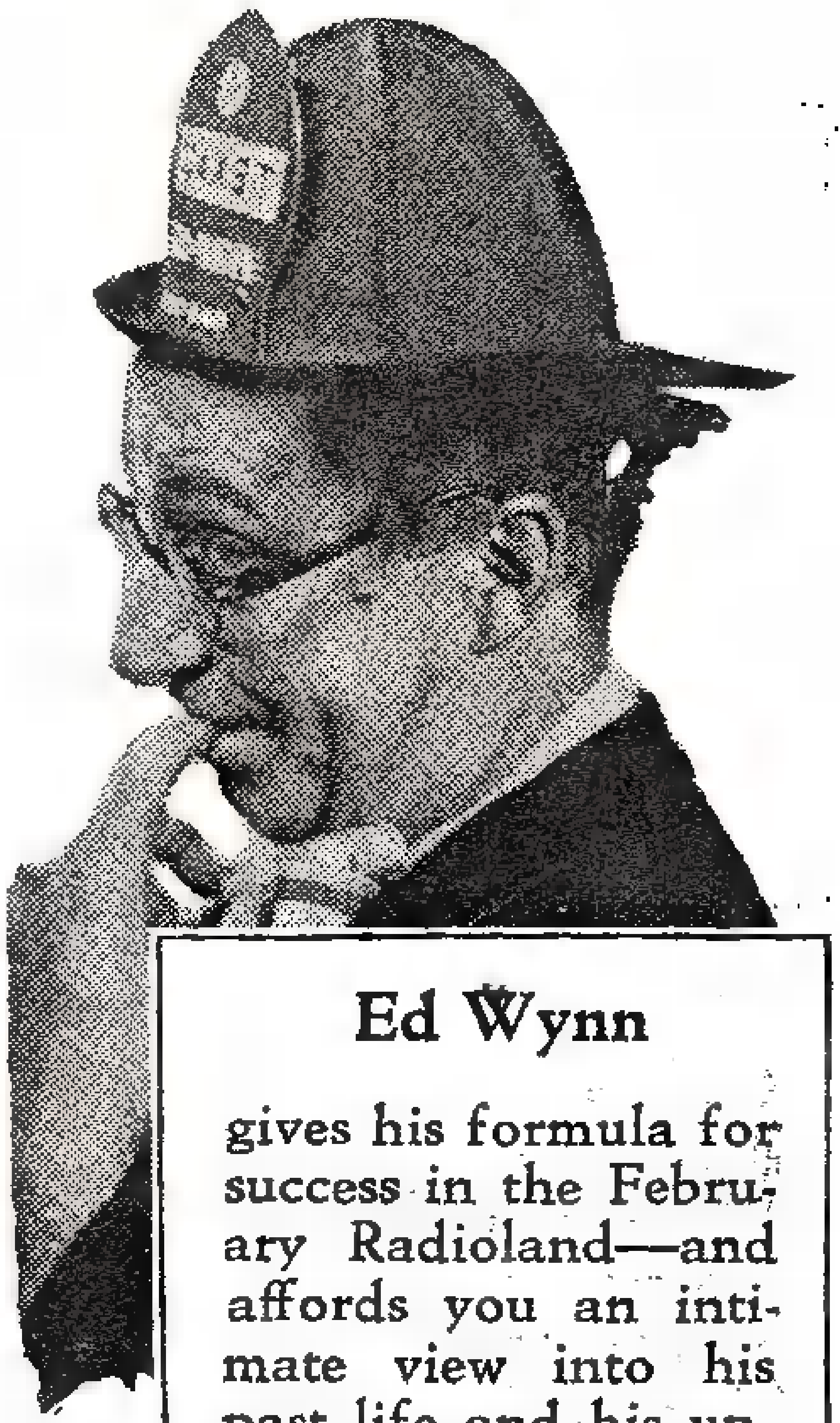

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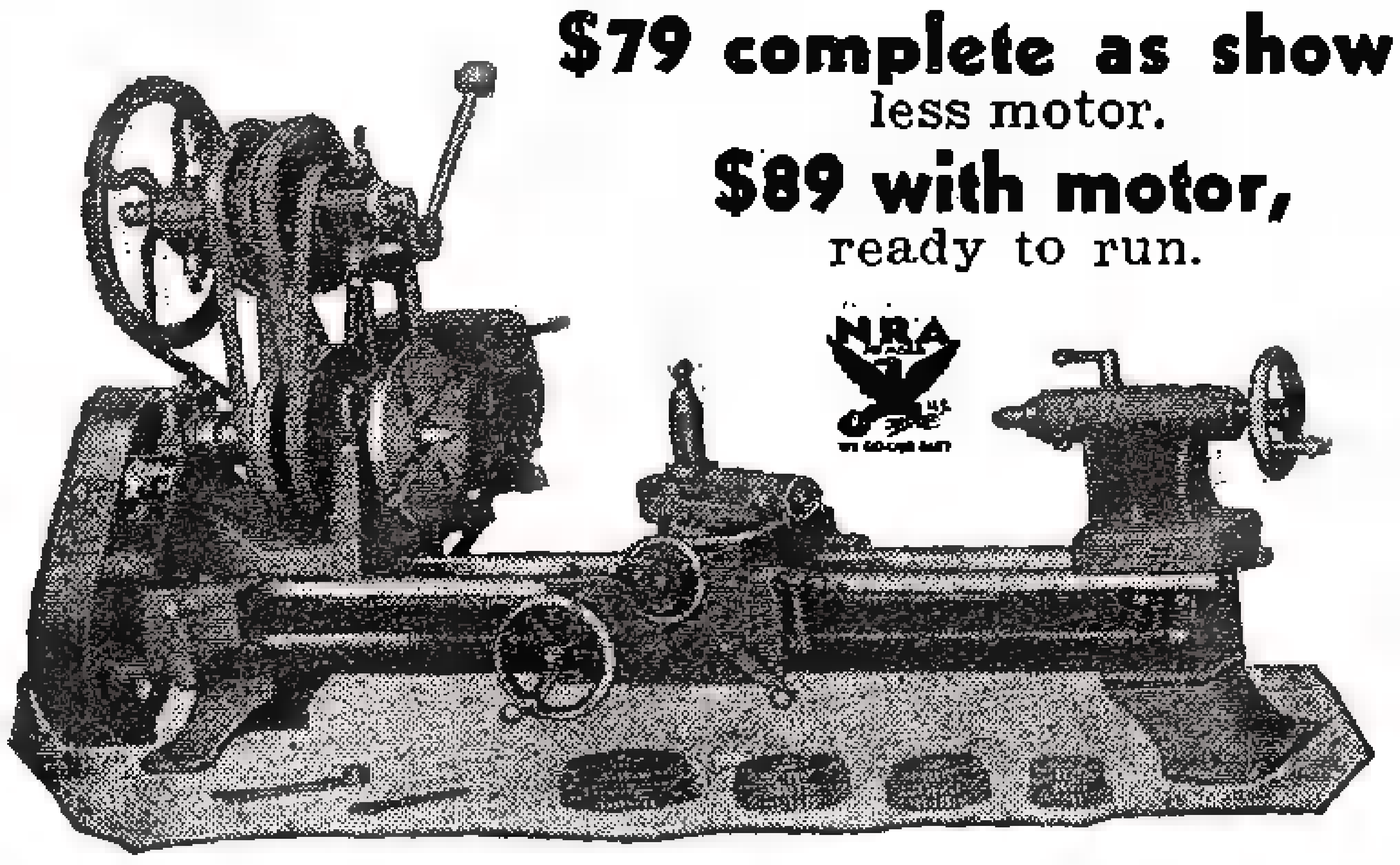

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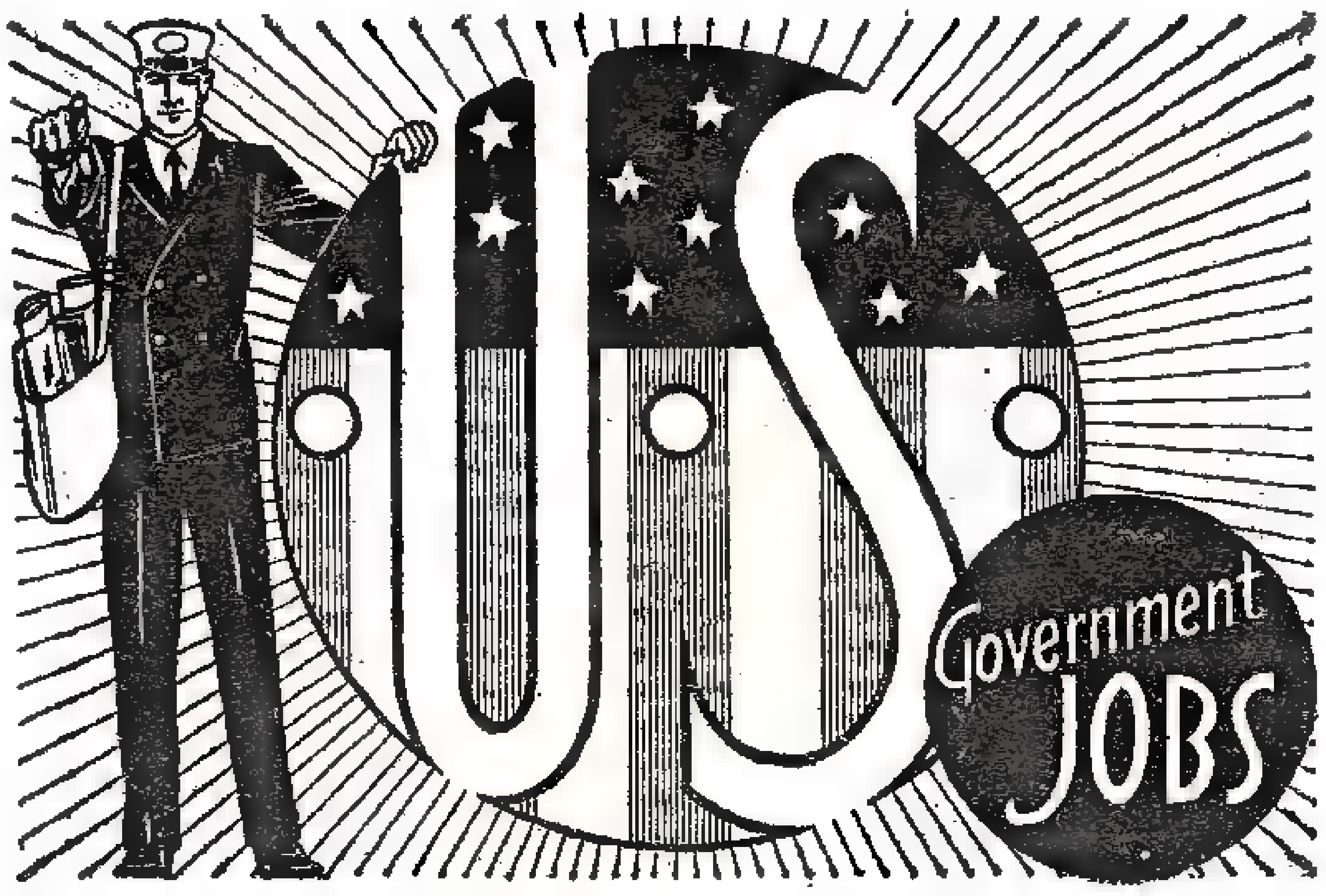

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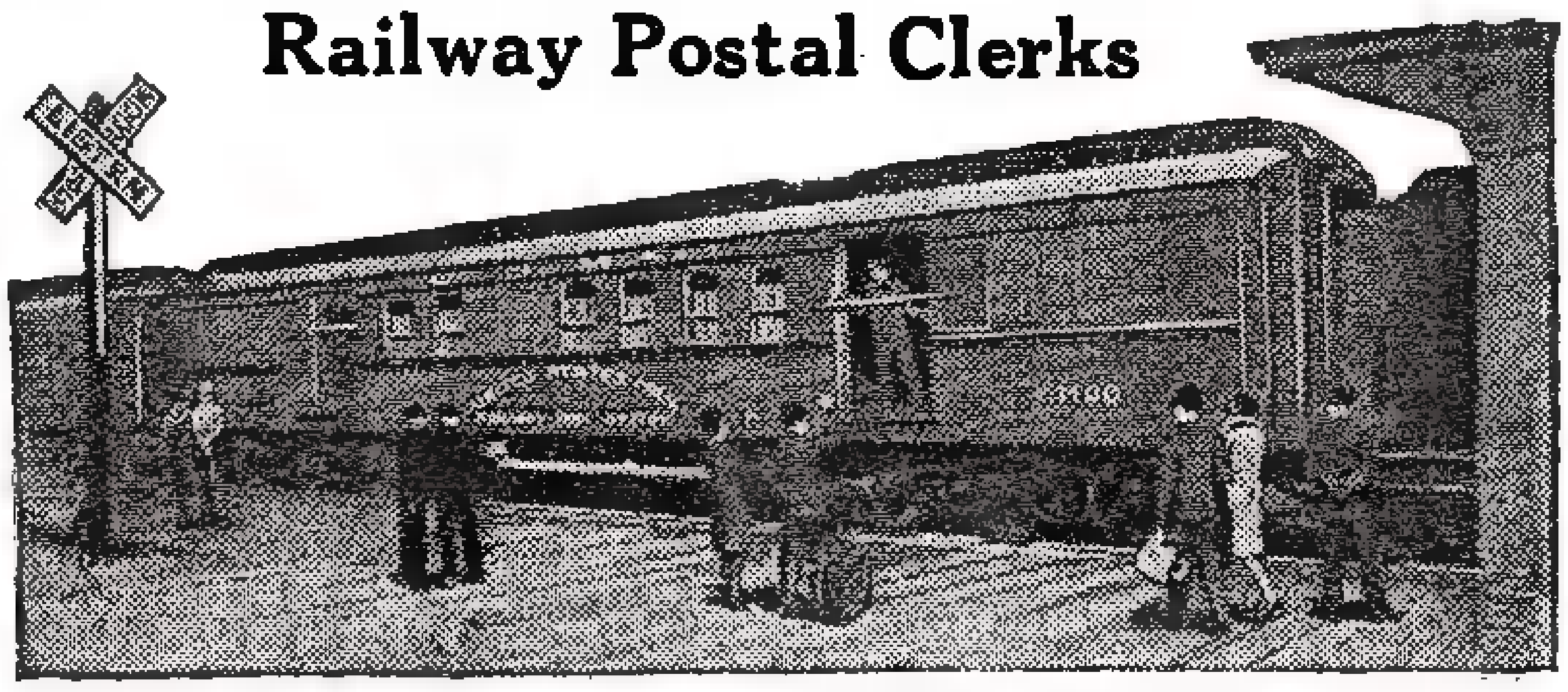

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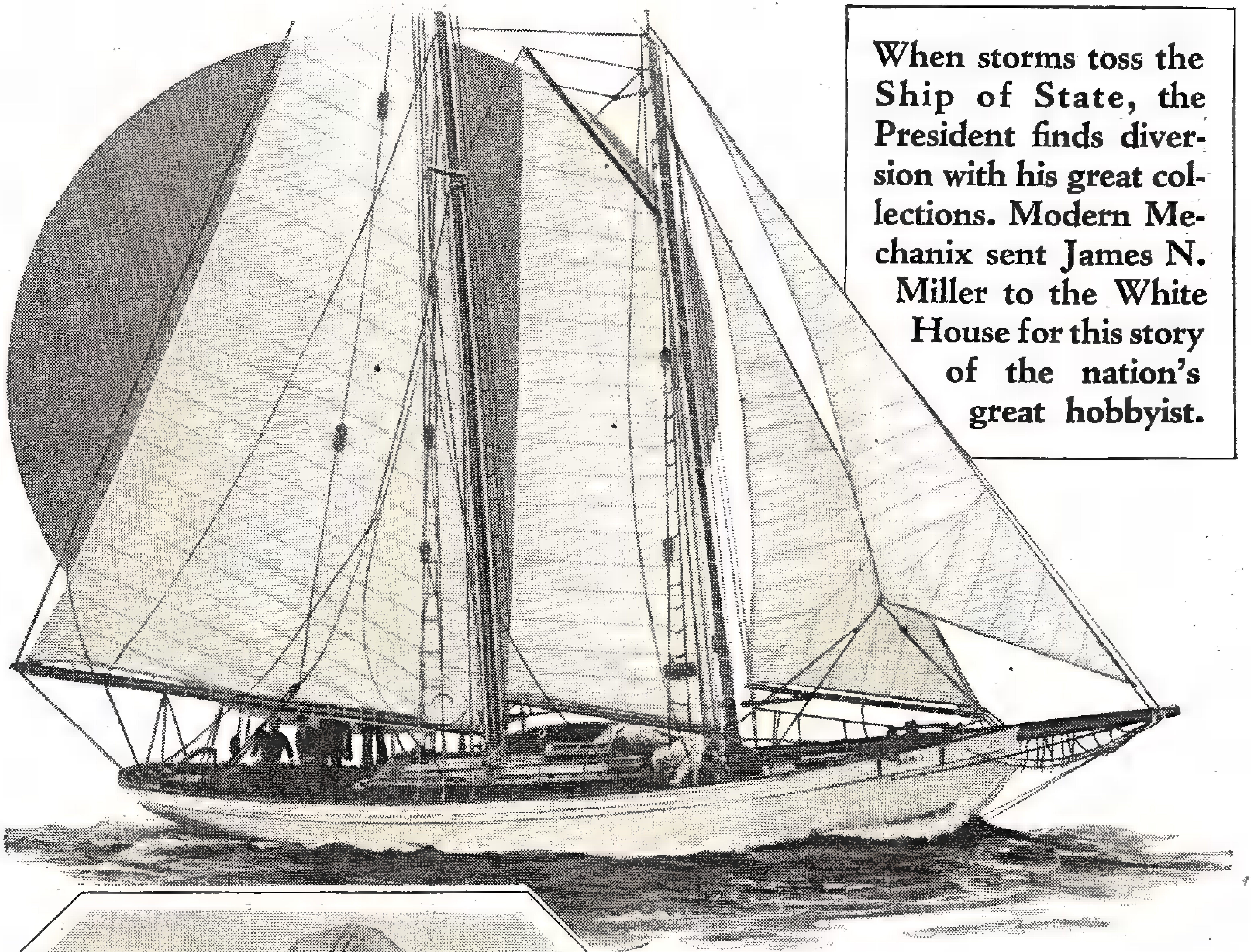
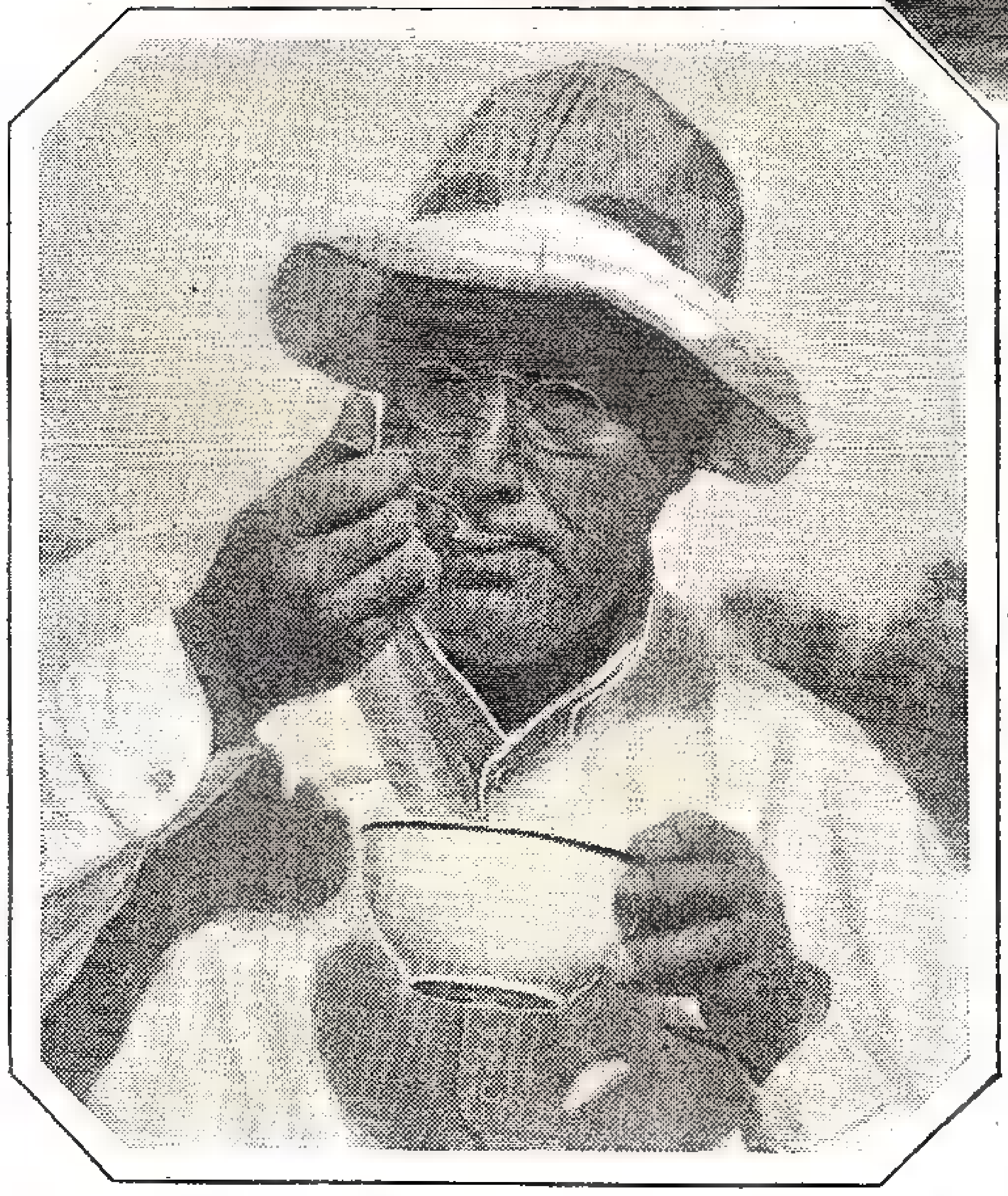


When storms toss the Ship of State, the President finds diversion with his great collections. Modern Mechanix sent James N. Miller to the White House for this story of the nation's great hobbyist.

Sailing is the President's favorite sport and his love for the sea is represented in all his hobbies. Above is a photo of the "Amberjack II", 45-foot sea-going schooner, in which he took a leisurely vacation cruise after his election.



As a boy President Roosevelt wanted to be a sailor, but his father sent him to Harvard. He enjoys sailing cruises with his sons. Here is an intimate pose of the President eating food cooked by himself on one of his vacation cruises.

by JAMES NEVIN MILLER

A SECRET service agent rapped on the door of the home of a retired minister in a suburb of Washington.

The clergyman opened the door. The government agent flashed his badge. Timidly, perhaps apprehensively, the minister asked the man to step into the living room.

Imagine his astonishment when the agent announced:

"Your Reverence, the President would like to have you drop in some day at the White House. He'd like to see you about your stamp collection. He says that you should bring it along so that he can take a look at it."

The clergyman, noted for his stamp collection, relaxed and excitedly replied that he would be delighted to come "whenever convenient for Mr. Roosevelt."

THE FIRST COMPLETE STORY OF THE NOTED

White House HOBBIES

When the day's work is done at his desk in the White House, the President often turns to his stamp collection. He is a philatelic fan with 20,000 stamps in 30 volumes.

This anecdote is just a sidelight in the life of the nation's chief executive, but it adds to an understanding of the character of the President of the United States.

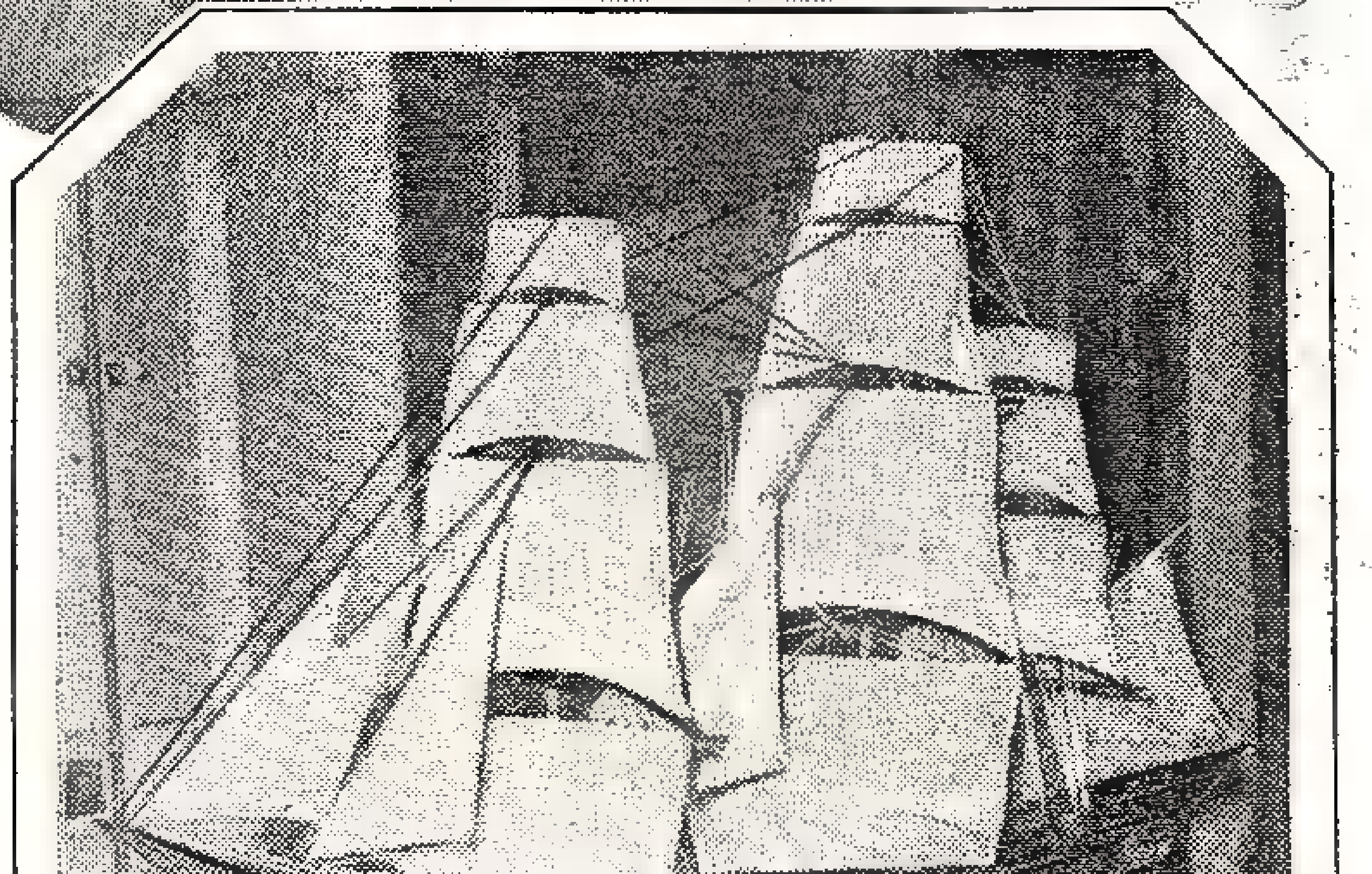
To understand great men thoroughly one should know their avocations, their hobbies, the diversions that occupy them in their leisure time.

The Prince of Wales, in addition to golfing, horseback riding, and dancing, knits and crochets. He claims that knitting rests him when he is tired. Henry Ford is fond of collecting old buildings, furniture, and vehicles. Andrew Mellon is known as a collector of paintings and rare books.

Sits in Bed Pasting Stamps

President Roosevelt might be called the nation's leading hobbyist. When the troubles of the country bear heavily upon him, the chief executive is able to forget his worries among his great collections. Sometimes far into the night he will sit in bed pasting stamps in albums.

Stamp collecting is only one of his hobbies. Love for the sea seems to dominate all his pastimes. His collection of naval books, engravings, paintings, pamphlets and ship models is considered the finest in existence in private hands.

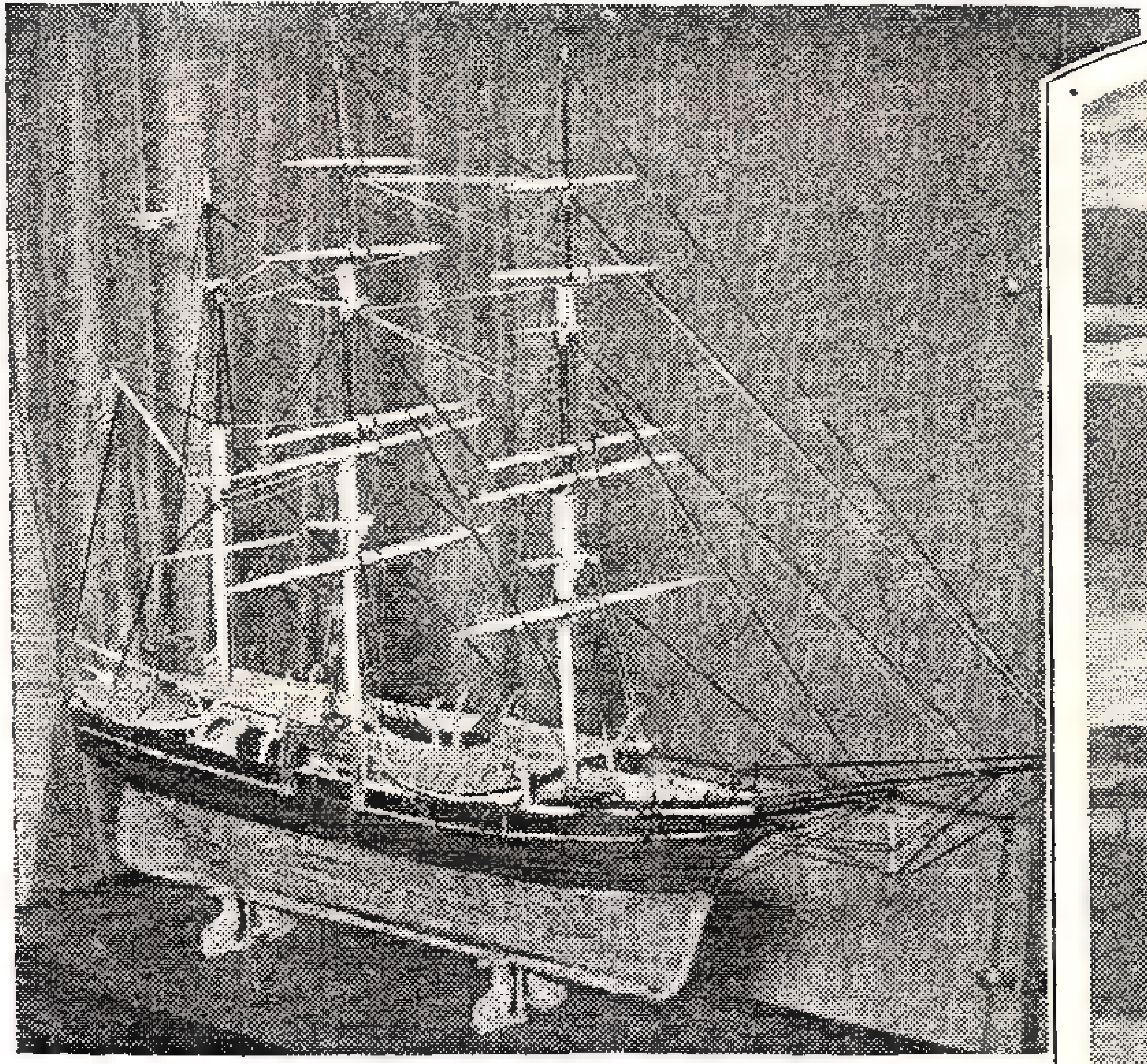


Exclusive Modern Mechanix Photo

The "Raleigh," early American war vessel, is one of the prized models in the President's collection. The models are part of a greater collection that is a realistic history of the heroic and stirring events of the United States Navy.

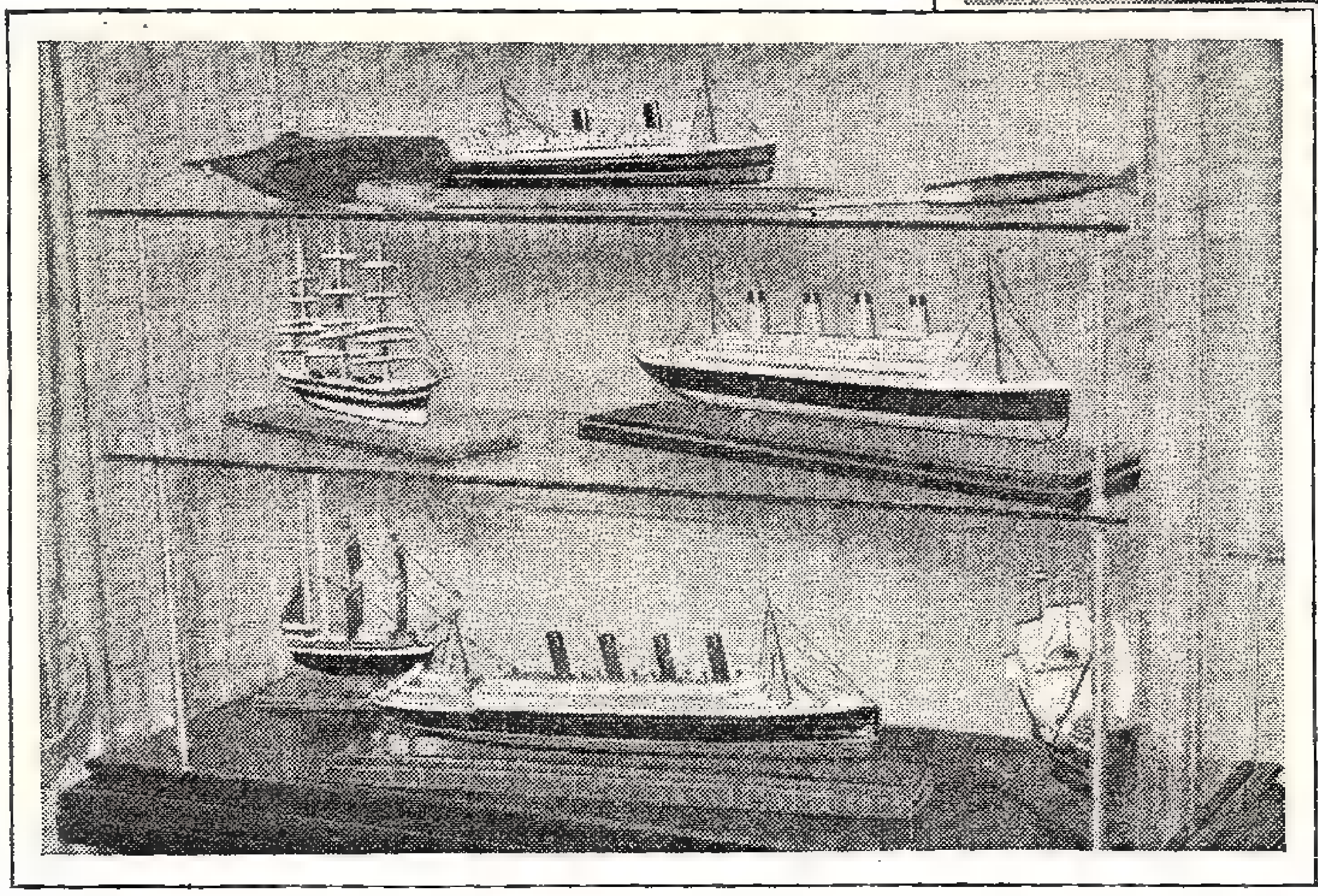
Except for official reports and documents, it is possibly superior to that in the Congressional Library. It consists of between 6,000 to 7,000 books, approximately 10,000 pamphlets, 450 framed lithographs and etchings and more than 60 paintings.

COLLECTIONS OF OUR CHIEF EXECUTIVE



Exclusive Modern Mechanix Photo

This model of the whaling ship, "Josephine," of New Bedford, is built true to scale and is complete in all details. It is one of the prized models of the President.



When the President goes to sea in a sail boat, he handles the helm himself. He returns happy, tanned, and rested as shown above. At left is a glass case in Mr. Roosevelt's study containing eight models. Top row, left to right are, model of a whale; "La Provence," French liner; swordfish model. Middle—The "Malcolm L. Cropley," early American brig; and the S. S. "Olympic." Bottom—The Pilgrim Mayflower; the S. S. "Mauretania," another Mayflower model. The President himself has supervised the designing and building of many of his models. He has built miniatures of every home in which he has lived.

Exclusive Modern Mechanix Photo

His stamp collection consists of 20,000 stamps and 30 volumes, one of the largest in the country.

While governor of New York, Mr. Roosevelt kept his favorite Navy collection in his Hyde Park, N. Y., and New York City homes. His study, the library, even the halls and part of the staircases were almost covered with some of the finest known paintings of American ships.

At his Hyde Park estate he kept most of his favorite ship models. All of these models were made by hand and in most cases each is a perfect reproduction of an original ship. These wonderful miniatures are worth thousands of dollars.

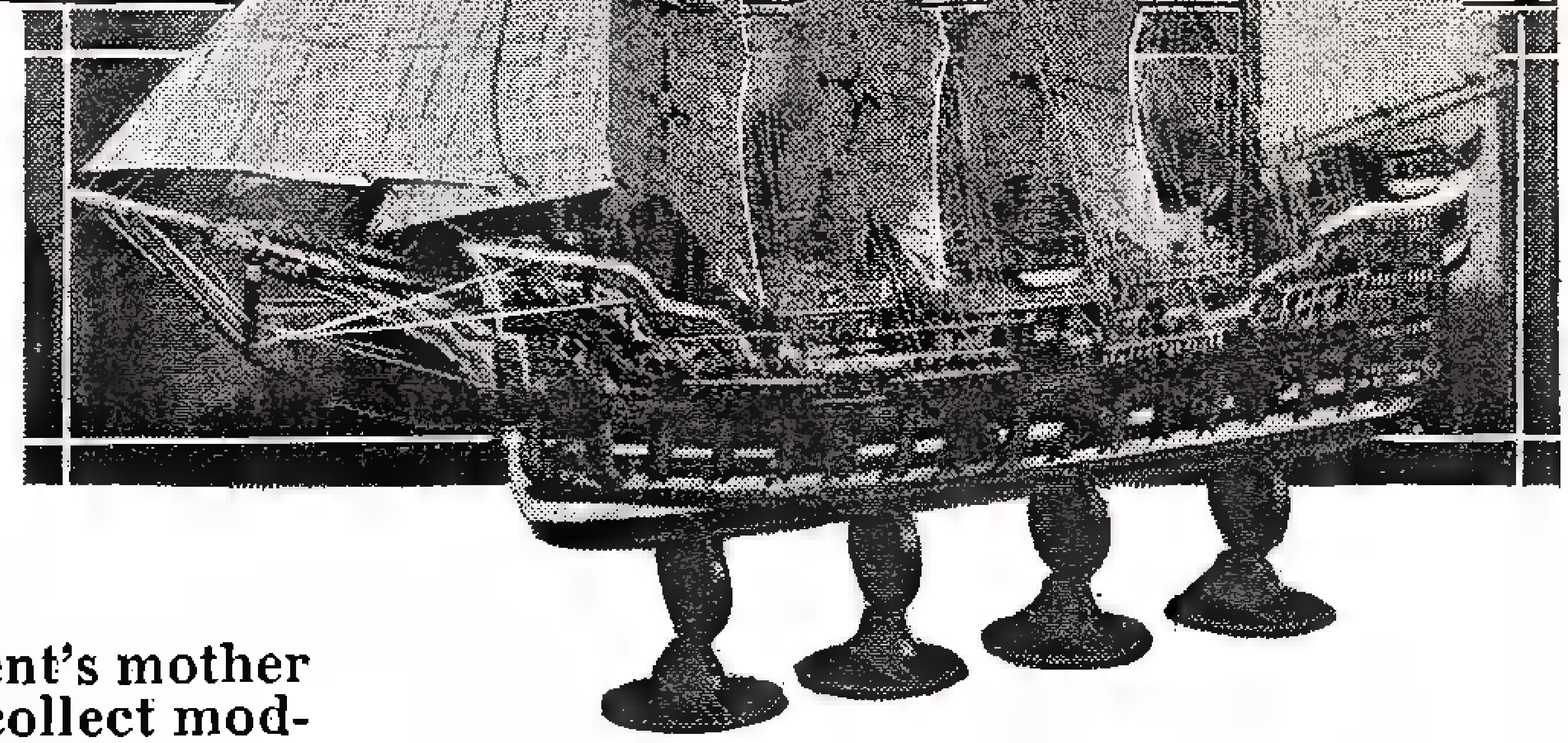
Together with the paintings and lithographs these models give a graphic and vivid history of exciting and heroic deeds of the American navy.

Upon becoming President, Mr. Roosevelt sent for only the best models and paintings. Yet there was a sufficient number to decorate three rooms of the White House: the President's bedroom, study, and office.

None but Mr. Roosevelt's most intimate friends are permitted to visit the bedroom. The study on rare occasions may be seen by authorized persons. The writer was given permission to visit the White House, and take along a photographer to view and photograph the President's hobbies.

Incidentally, before describing these collections, it would be best to reveal another interesting angle concerning the President

President Roosevelt Designs and Builds Many of His Own Prized Models



Above is a glimpse of the study on the second floor of the White House where the President often confers with foreign envoys. It is furnished with the most prized models and naval paintings of Mr. Roosevelt's collection. Modern Mechanix and Inventions' correspondent gives a description of the room in the accompanying article. At right is one of the models. It is a full rigged frigate, war vessel of the Revolutionary war. Hand-made in every particular, the model is worth thousands of dollars.

and his avocations. The President's mother revealed that, not only does he collect models, but that he also enjoys supervising the designing and building of models of both ships and houses.

Every house in which Mr. Roosevelt has lived has been reproduced, under his supervision, in a miniature model. The President himself, his friends say, has built many models of houses.

Painting Saved "Old Ironsides"

Shortly after his election as governor of New York, he personally constructed an ingenious little model of the governor's mansion in Albany. He has also ingeniously built tiny models of cottages at the Warm Springs, Ga., sanitarium.

Returning to the White House—just back of the President's desk in his study is a remarkable group of paintings of early American ships, mostly men o'war. One is the famous original painting of the *Constitution,* by the noted American artist, Gordon Grant.

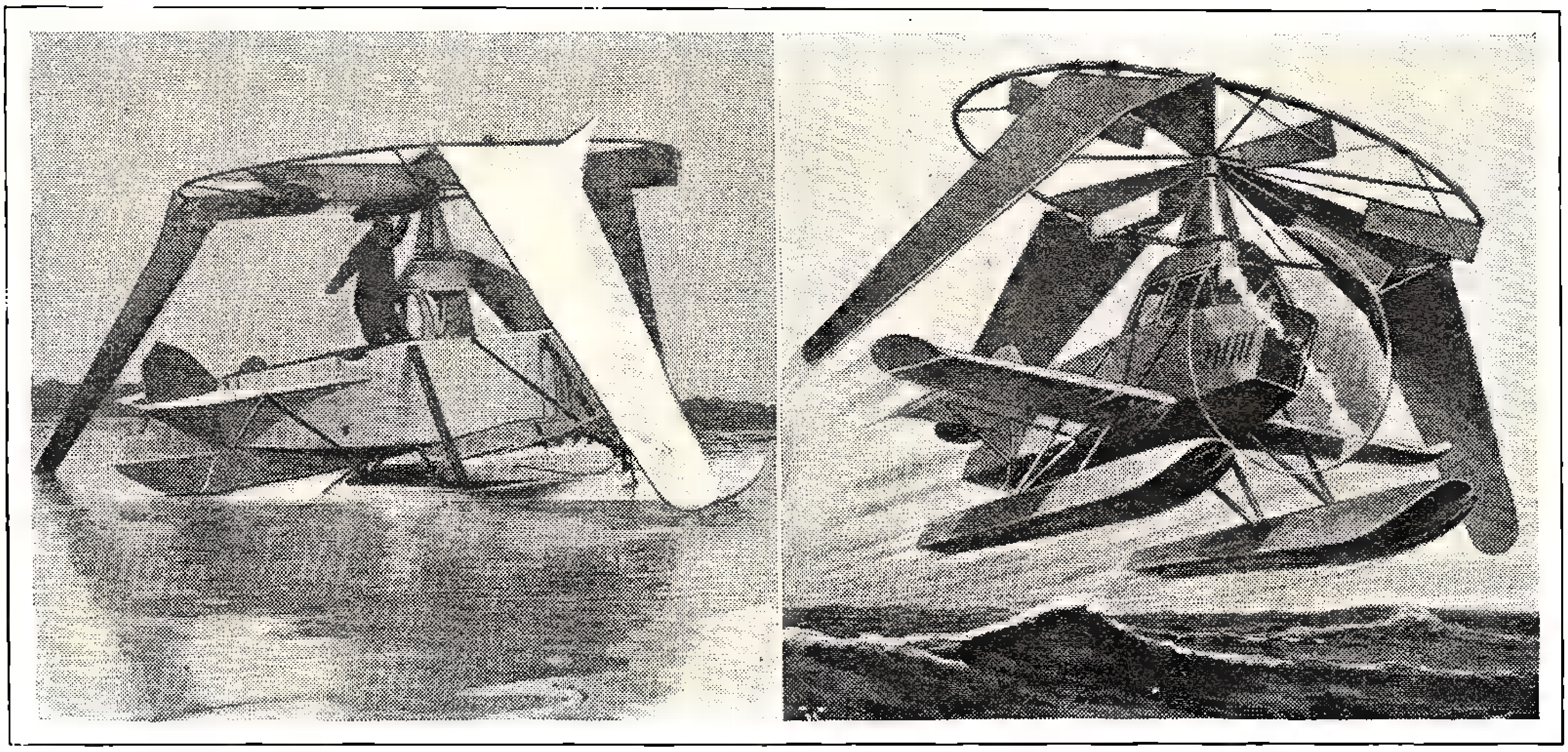
This is the painting that saved *Old Ironsides,* noted for her distinguished victories in the Revolutionary War and the War of 1812, from becoming a loss as a treasured historical ship. In 1925, it will be recalled, Congress authorized restoration of the *Constitution,* but appropriated no funds for the purpose.

To save the old ship it was decided to raise the money by private contributions through the sale of copies of the painting in Mr. Roosevelt's possession. Approximately 4,500,000 school children contributed. In all $725,000 was raised and now the *Constitution,* completely restored, is paying her respects to cities on the Pacific coast.

Another famous painting in this group shows the loss of the *Kearsarge,* well known Union man o'war of the Civil War. She was one of the earliest of Uncle Sam's steam war-sloops. The *Kearsarge* earned her place in American history by her victorious battle with the Confederate steamer, *Alabama,* off Cherbourg, France. The White House painting shows the famous ship some years later, sinking after being wrecked on Roncador Reef, in the Gulf of Mexico.

(Continued on page 121)

Queer Wing-Flapping Plane Ascends Vertically Into Air



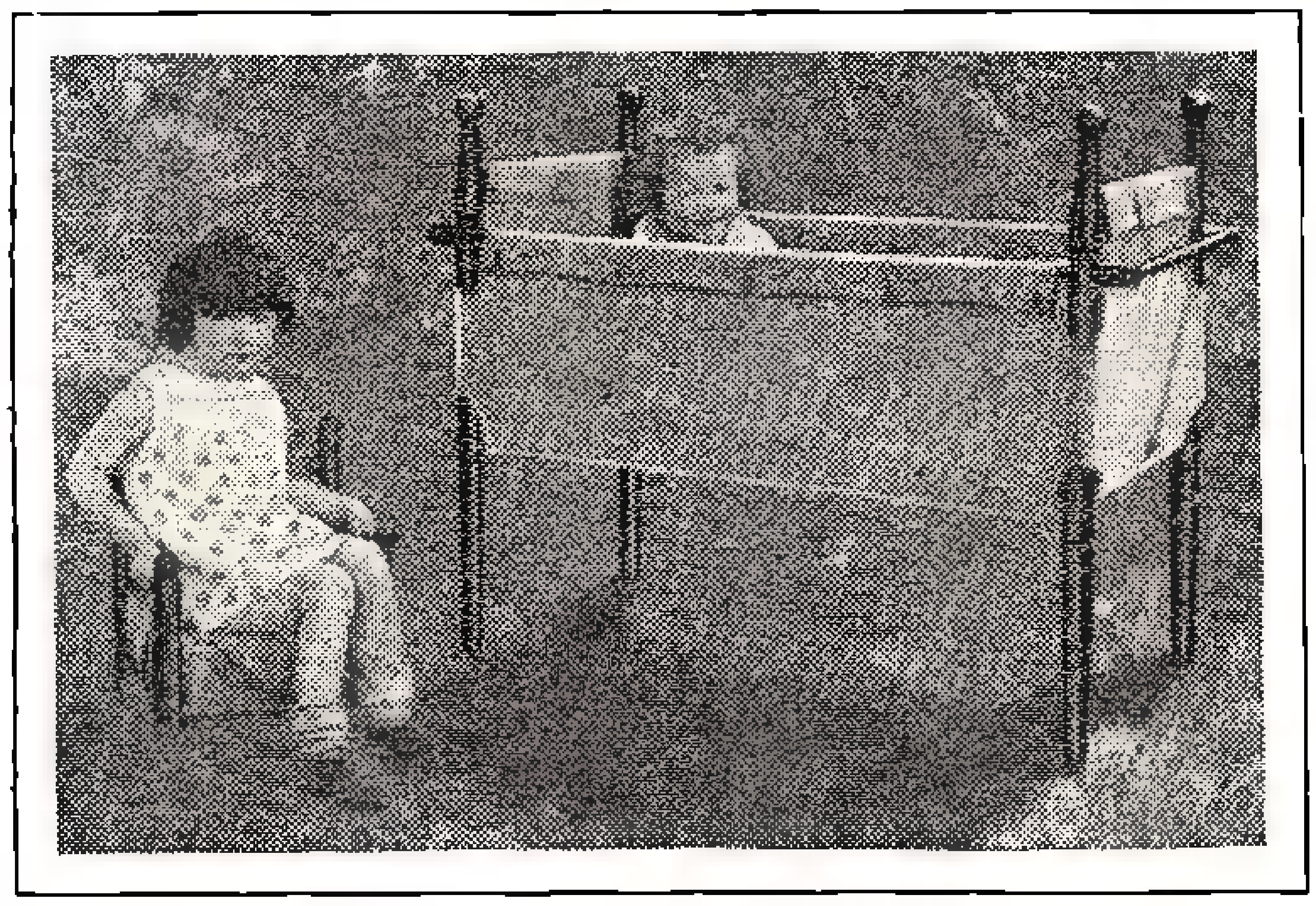
Seaplane, autogyro, helicopter—whatever it is called, this strange craft can rise straight up in the air, fly in level flight like an ordinary plane, and take off or land on water. Right: Artist's sketch of take-off as seaplane on water.

A QUEER-SHAPED aircraft, seemingly a combination of everything which has ever flown through the air, has proven successful in initial tests, doing just about anything in the way of performance that could be asked of a heavier-than-air craft. Jette, designer, a young Swedish engineer of Stockholm, believes his radically-designed plane will revolutionize the aviation industry.

Stubby wings like those of the earlier autogyros give the plane stability in horizontal flight. The engine drives a propeller mounted forward as in the ordinary land plane, and through gears turns the huge overhead rotor. Three flapping wings attached to the rotor move up and down as they spin, just as in an autogyro, and vanes on the inside of the rotor provide lifting force.

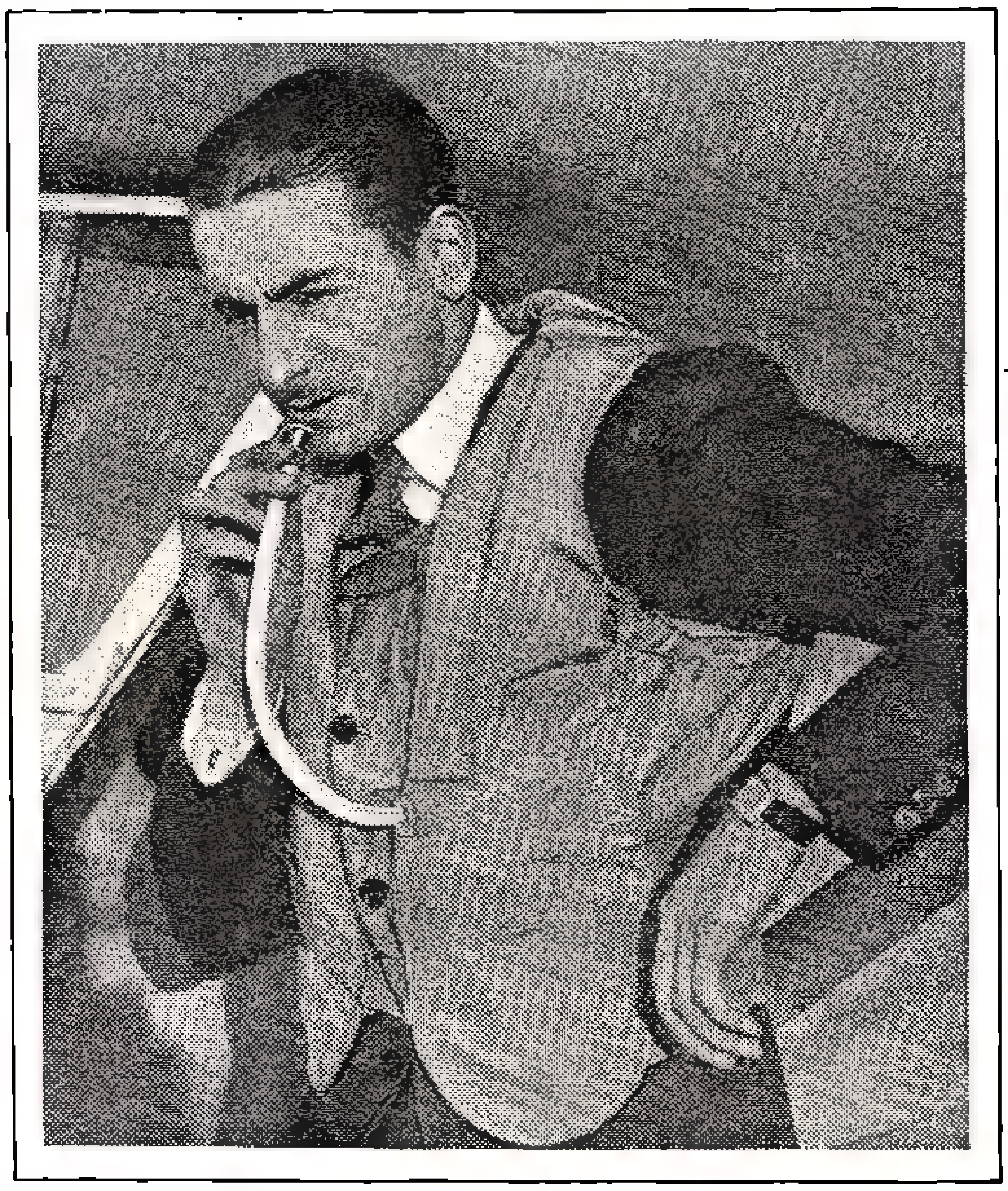
Baby Crib Carried in Auto

FOND mamas have a great convenience in a new crib which can be folded up and transported anywhere.



Portable crib can be set up in yard to amuse youngsters.

Air Jacket Saves Aviators' Lives



British aviators use this life-saving jacket which can be blown up in a few seconds, when forced to land on water.

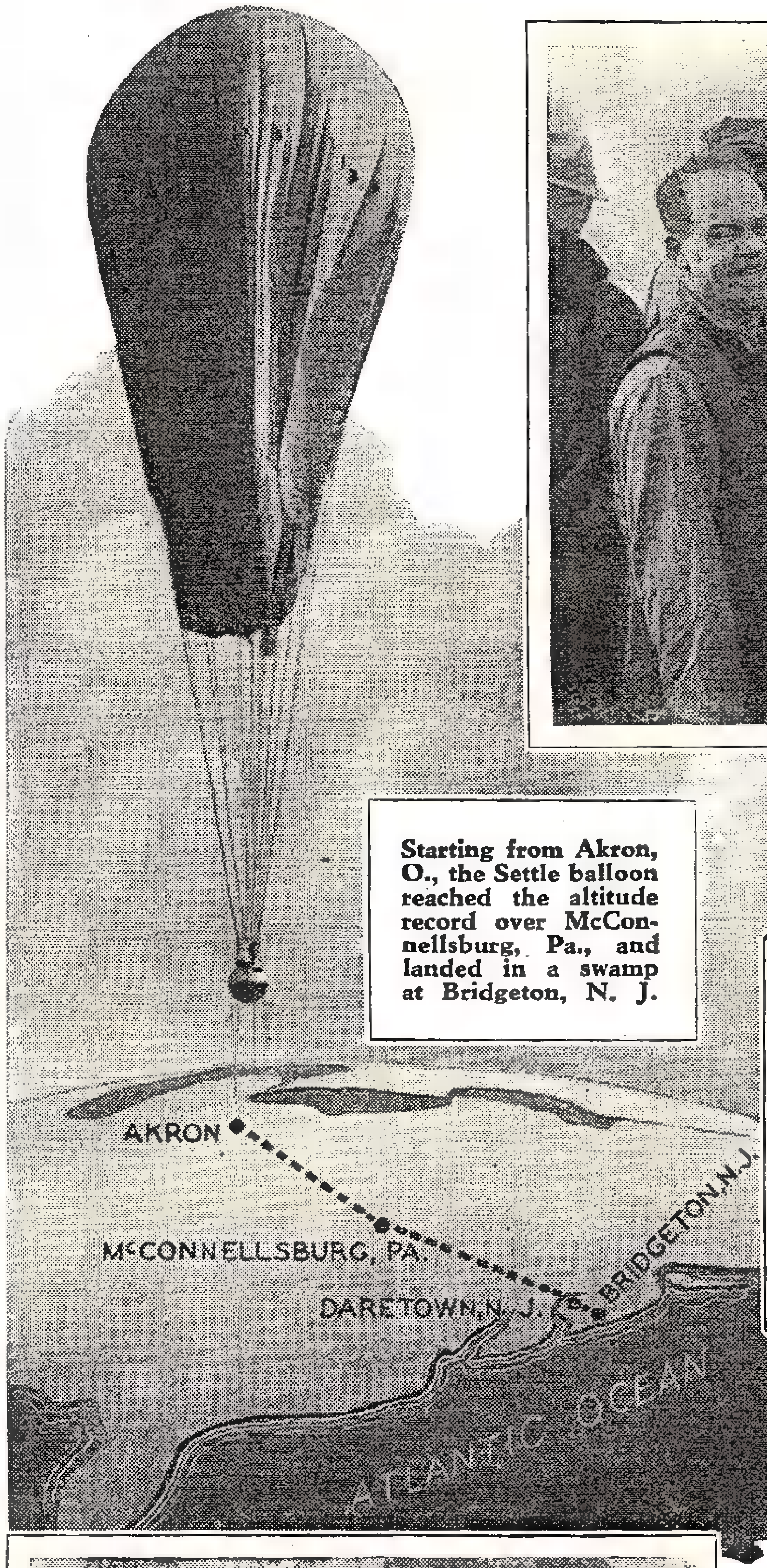
BRITISH Air Force members who fly over water no longer need fear forced landings.

Life saving waistcoats supplied to them are made up of two layers of waterproof material, and can be completely inflated in a few seconds.

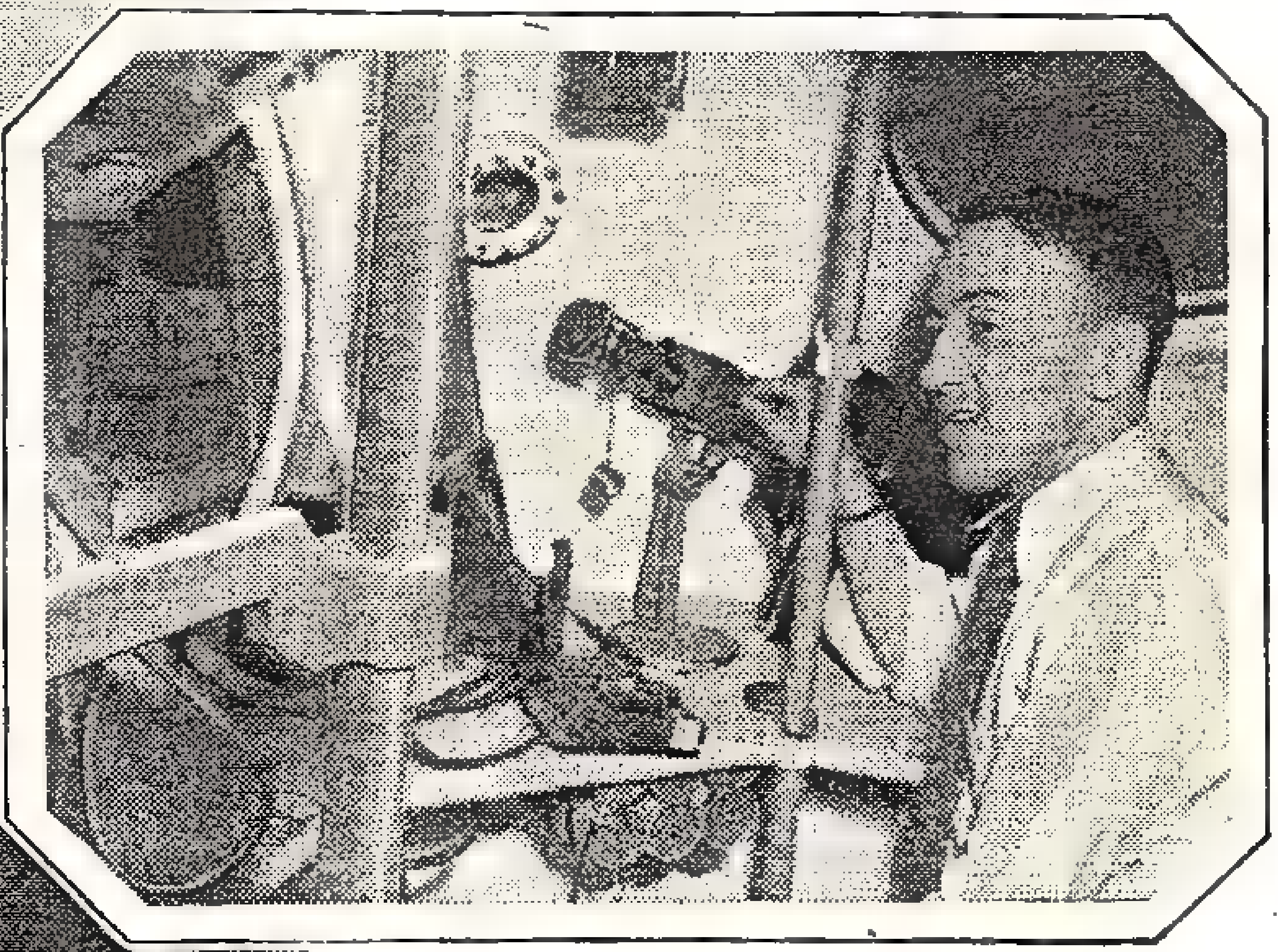
A rubber hose leading from the air-tight jacket has a nozzle and valve at the end for easy inflation by the aviator. The jacket in no way interferes with the use of the arms.

SETTLE Pierces "Night Beyond the Earth"

Settle (right) and Fordney are shown holding the barograph which recorded the record height of eleven and one-half miles.



Starting from Akron, O., the Settle balloon reached the altitude record over McConnellsburg, Pa., and landed in a swamp at Bridgeton, N. J.



Here is Lieut. Commander Settle inside the tiny gondola of their stratosphere balloon. He is adjusting a quartz spectrograph which recorded the intensity of ultra violet rays in the stratosphere.

Commander Settle is shown being towed in a duck boat by a state trooper after his balloon landed in a New Jersey swamp. The balloon just missed landing in Delaware Bay.

MAN'S last frontier, that mysterious region beyond the air, has again been explored. The balloon flight into the stratosphere of Lieut. Commander T. G. W. Settle and Major C. L. Fordney gave the United States the altitude record of 61,237 feet, more than 11½ miles.

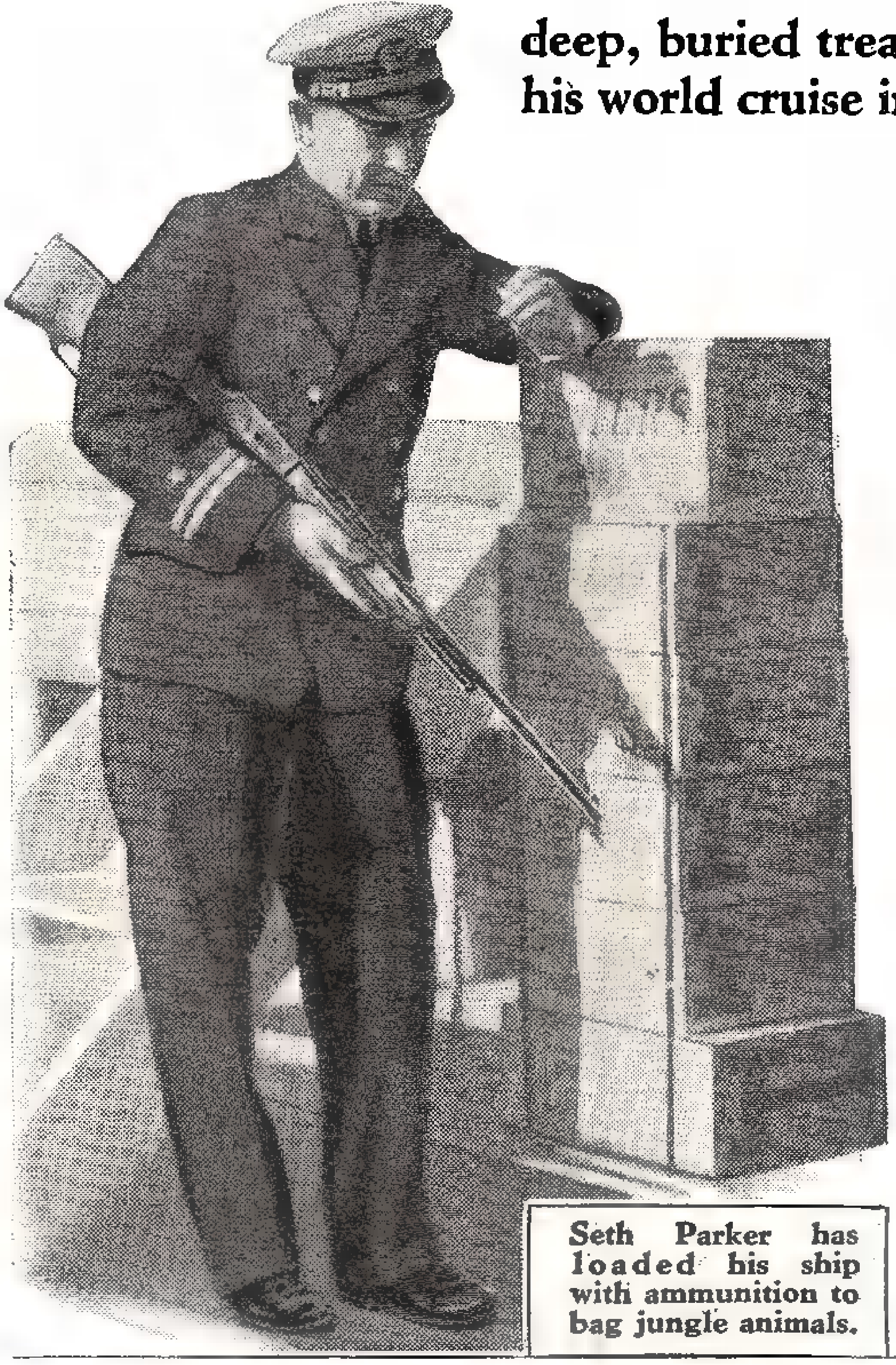
From that great height the balloonists talked to the earth by short wave. Great topographical features were visible, but they were not high enough to see the curvature of the earth. Settle had time to only glimpse the stratosphere, which he called "night beyond the earth."

Both men were busy with scientific instruments for studying cosmic rays and ultra violet rays. Bread mold spores were tied outside and were found unaffected by the rare, cold air.

Seth Parker's Sunday Meeting

Over the seven seas Seth Parker is seeking monsters of the deep, buried treasure and wild beasts. Here is the story of his world cruise in a windjammer, a boy's dream come true.

by ALFRED ALBELLI



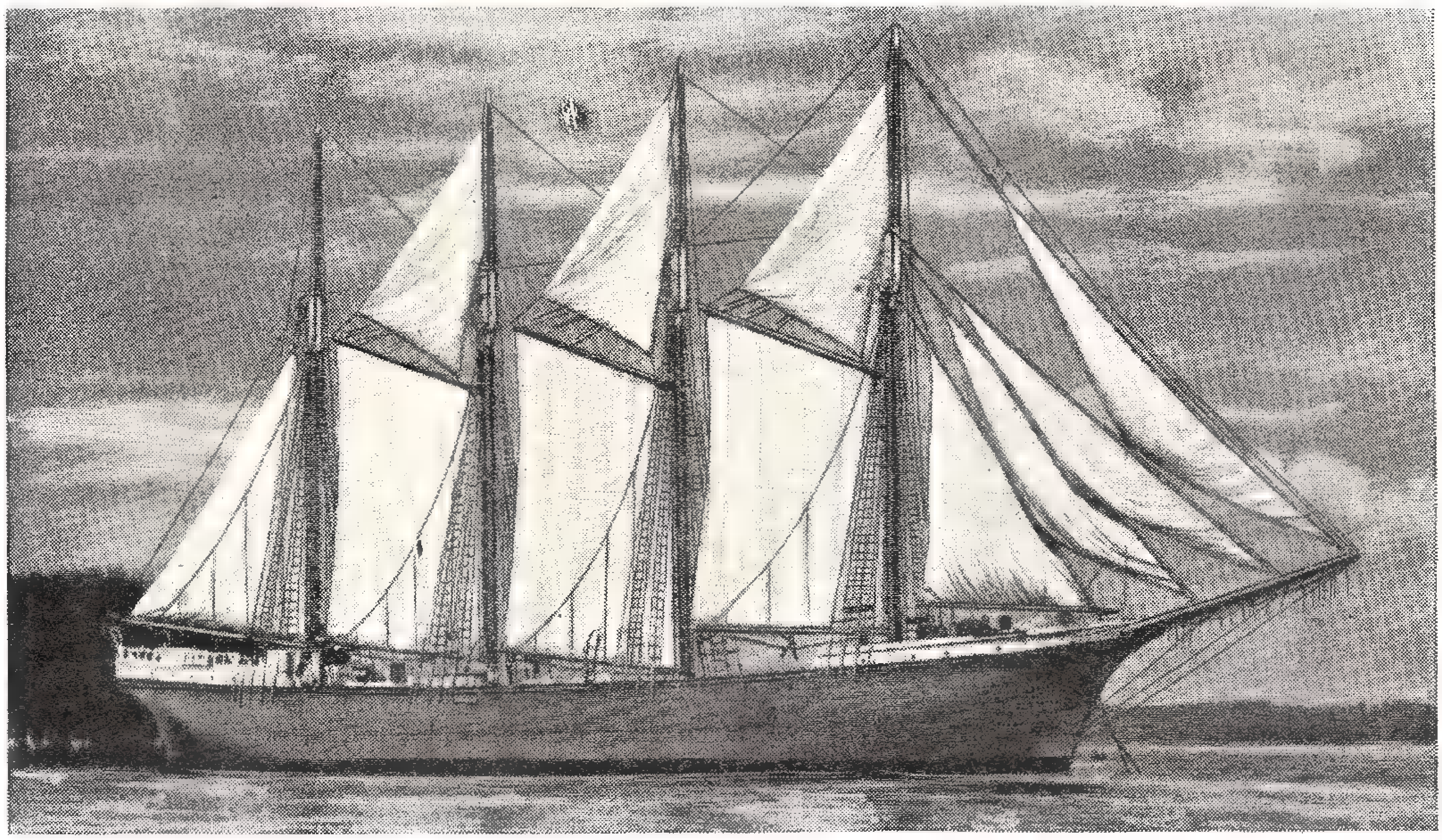
Seth Parker has loaded his ship with ammunition to bag jungle animals.

YO-HO, me lads, yo-ho, by gosh! Here we be a-tryin' to take a chaw agin' the wind on the sleek schooner "Seth Parker" on a latitude "somewhere" en route around the world, with the famous radio star as the skipper and a rip-snortin', puddin'-headed, home-spun crew to do the chores.

Seth Parker, as ye all know, is neighbor Seth from old Jonesport, Maine, who used to have the Sunday night socials where the folks got together singing hymns and having a grand gab fest. The NBC radio station in great big New York eaves-dropped in on these meetings and city dandies got to snickering over goings-on in Jonesport. But Ma and Seth Parker, a cheerful, homey couple, put Jonesport on the map and did as much for their home state as Rudy Vallee and his stein song, by cracky!

Offers to Take School Chums

Back in the days when Seth Parker, whose name is Phillips Lord in real life, was in high school, he promised a few of his chums that if he ever became wealthy he would take them all on a cruise around



This four-masted schooner, "Seth Parker" is taking the noted radio star around the world on a cruise of adventure. The interior of this windjammer has been refurnished entirely with modern conveniences to satisfy the ship's crew.

Sails for World Adventure

the world in a real sailing schooner of bygone days.

Fame and money have come to Seth Parker through his homey Sunday night Yankee broadcasts. Phillips Lord is keeping his promise. After much searching, he found a fine old four masted schooner. He bought the ship and named it *Seth Parker.* Then he set out to get a crew who knew the difference between fore topgallant braces and flying jib booms, spanker sheets and main sheets; men who knew their sails and riggings.

Old salts who had sailed before the mast of windjammers were hard to find, but at last Seth Parker rounded up enough to man his schooner, only to find that rough going was still in the offing. The men could handle the ship, but they did not want the forecastle bunks, the mess table, and the salt pork of the old days.

Crew Wants Modern Luxuries

They wanted modern conveniences. Before he could set sail Seth Parker had to install an electric lighting system, electric refrigerator, air conditioning, and other up-to-date luxuries that appeared out of place in the old schooner.

The crew was satisfied and Phillips Lord notified his old pals he was ready to keep his promise. Here another hitch came into his plans. The friends notified him that their wives would not permit them to go.

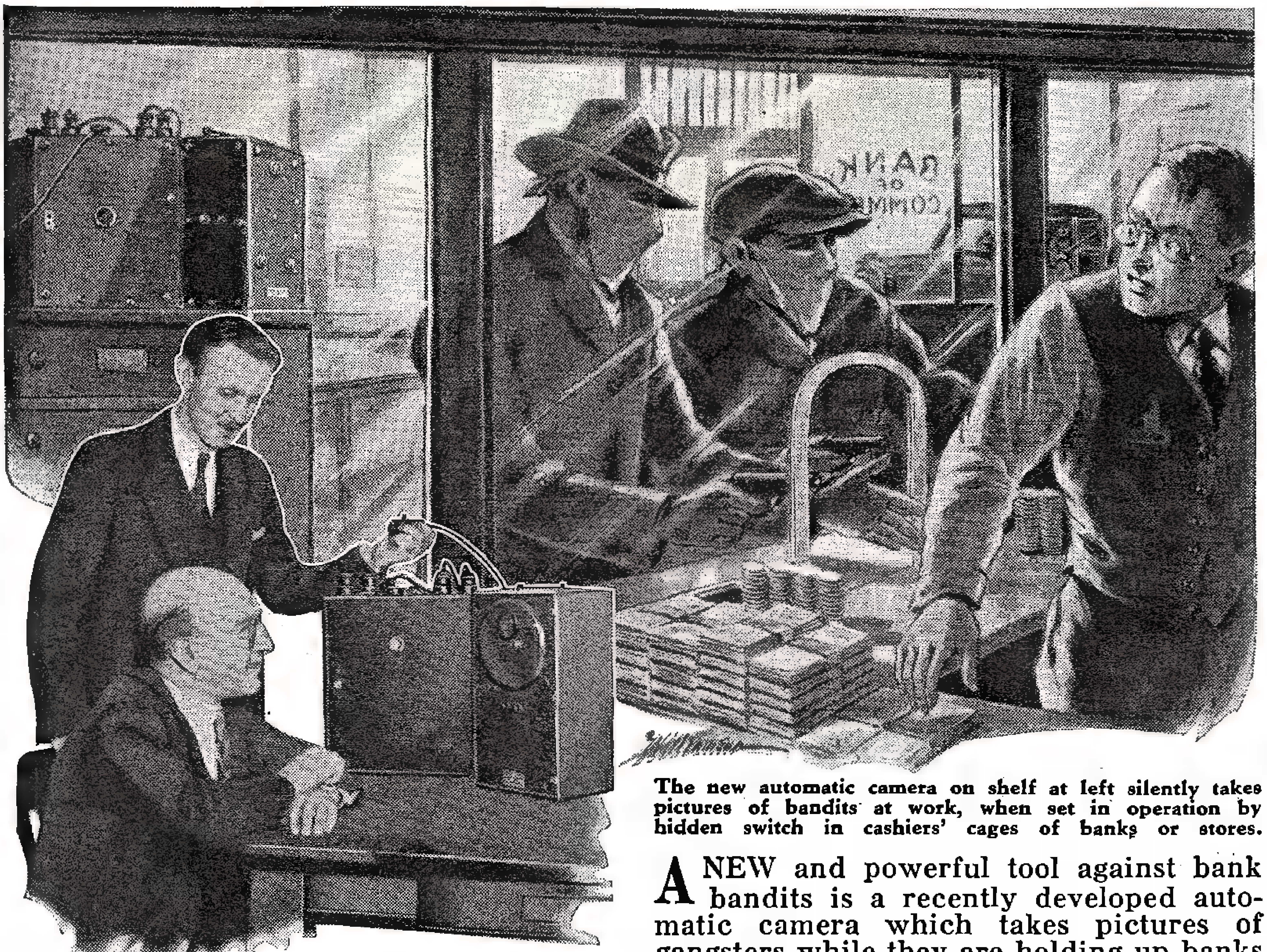
Without his pals Seth Parker put out from Portland, Me., in his remodeled wind-

(Continued on page 134)

"Ma" and Seth Parker in character will enact their Sunday Yankee socials during the world cruise. Seth Parker's real name is Phillips Lord.

The old fashioned New England parlor that forms the background for Seth Parker's famous hymn and gossip socials. The entire cast has been taken on the world cruise to continue the weekly broadcasts by short wave from the ship.

Automatic Camera Snaps Raiding Bandits



J. Frankenberg (seated) watches Eugene Cole press the switch which starts the new bandit identification camera.

The new automatic camera on shelf at left silently takes pictures of bandits at work, when set in operation by hidden switch in cashiers' cages of banks or stores.

A NEW and powerful tool against bank bandits is a recently developed automatic camera which takes pictures of gangsters while they are holding up banks or stores. Even though the bandits may be masked, the camera will catch peculiarities in the movements of the men, little identification marks on their hands, and every detail of their clothes.

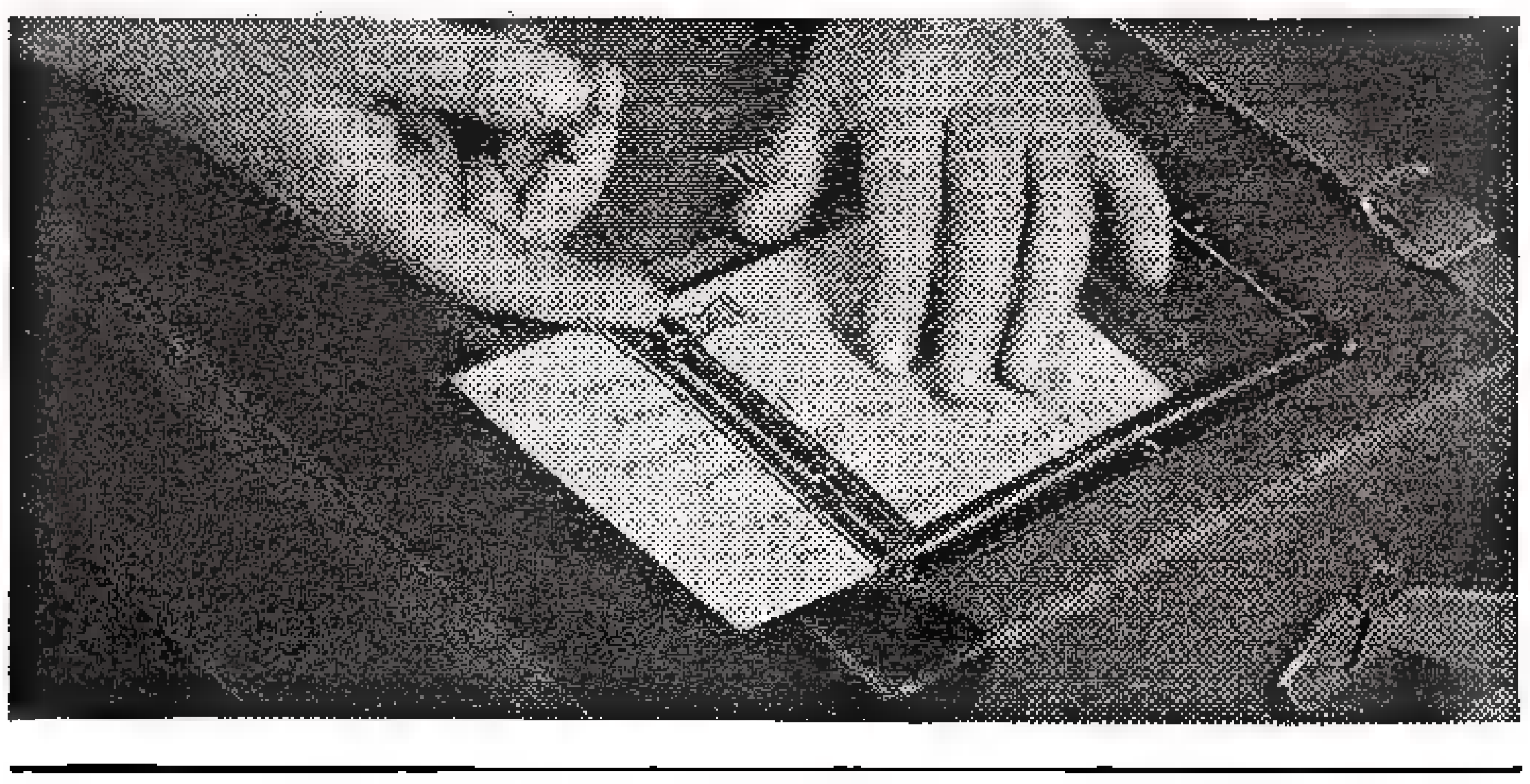
The new camera can be set on an out-of-the-way shelf some distance from the cashier, or concealed in the walls, and focused to record movements near the cage. Remote control switches at every desk in the bank need only to be touched or brushed against to set the camera in operation.

Laundry Can't Be Lost in New Case

STUDENTS who mail their laundry home each week can be sure that it will arrive safely, thanks to a new locking spring which prevents address cards from slipping out of the pocket on top of the mailing case.

The patented feature permits the insertion or removal of the address card by simply raising a locking spring. The metal card holder is riveted to the lid of the box.

New cards can be used each time the carrier is mailed, eliminating the necessity of scraping off old labels and stamps.



A simple locking spring holds address card containing stamps in the metal frame riveted to the cover of the laundry mailing case. Card is removed by raising spring.

Glass Jar Caps Defy Housewives

EVER try to screw off a bottle top that refused to be unscrewed? Perhaps it really was unscrewable, as were so many of the jars tested by the Pittsburgh Testing Laboratories.

Ten different unopened bottles and jars of grocery goods were brought into each of fifty kitchens to be opened. Each housewife was told to open the jars any way she liked, this meaning everything from banging the bottles on the floor to calling hubby.

Of the 500 jars, 96 could not be unscrewed with the hands, and 40 of these defied all efforts of the housewives.

Manufacturers are studying results of this test, in order to find a cap which can be opened by even the weakest-armed woman.

Banner Crop of Cactus Fruit Made Into Candy and Jelly

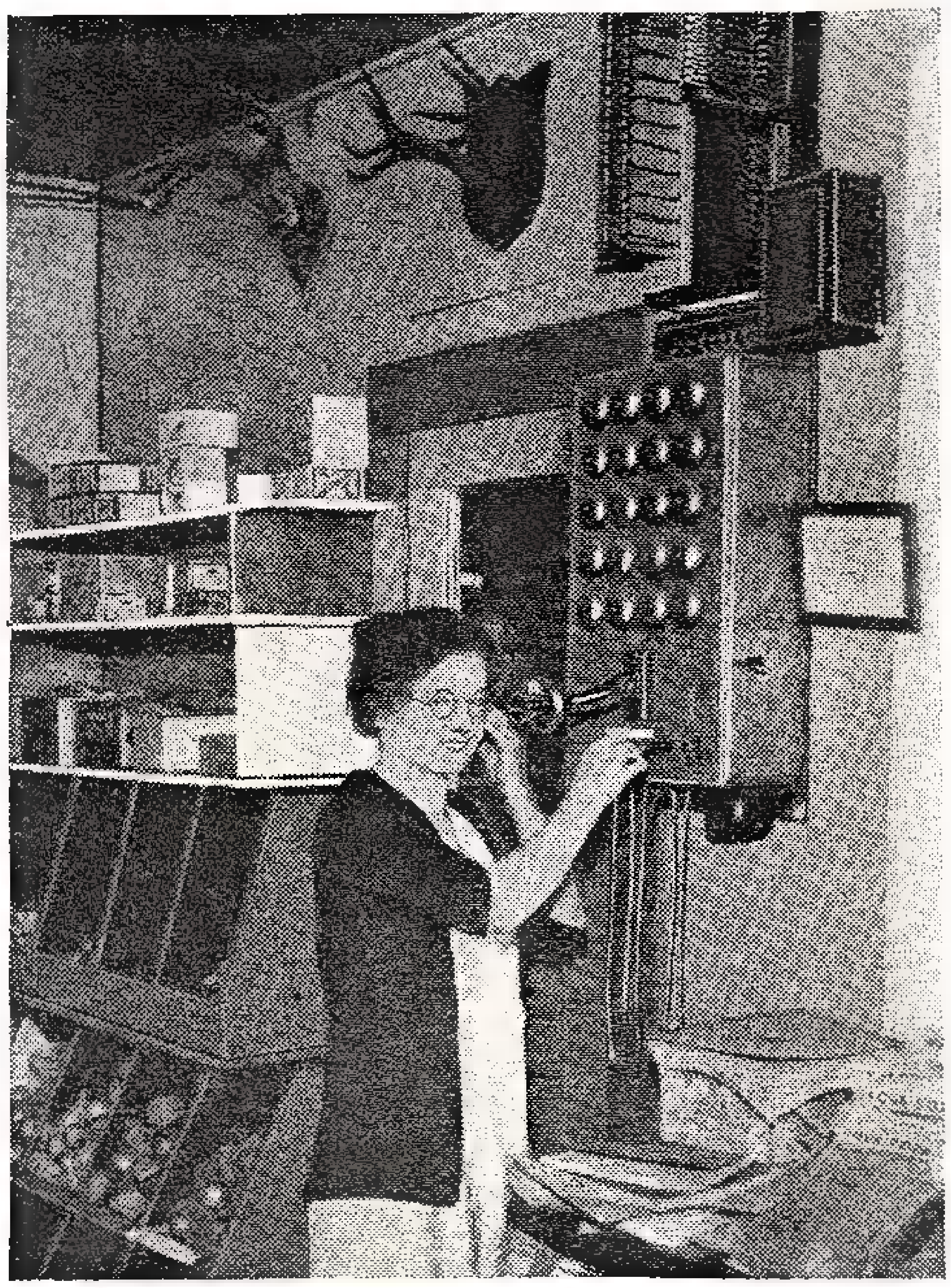
THE largest cactus fruit crop in the history of Southern California was obtained by ranchers of this arid region this season. Ranchers who once despised and grubbed out the thorny plants are now turning to them for a living.

The thorny fruit is preserved for sauces, is pickled, made into excellent jelly, and even used for tasty candies. The fruit is declared delicious by those who eat it raw.

The variety of cactus now being cultivated is a result of the researches of Luther Burbank, noted plant experimenter. He selected specimens of the ordinary desert cactus, and kept replanting specimens which showed smaller thorns and larger, tastier fruit, until a satisfactory fruit was obtained.

Miss Sidney Carroll picks cactus fruit from a heavily bearing patch near Pasadena, Calif. She says the raw fruit is delicious, and makes fine candies, sauces and jelly.

Old Phone Holds Unusual Record



Mrs. Z. E. Robertson operates the furthest west telephone exchange in America, an old fashioned switchboard stationed in the general store of the town of Bay, California.

THE tiny town of Bay, California, holds the distinction of having the furthest west telephone exchange in America. The old-fashioned switchboard is stationed in the general store, and tended by the storekeeper, Mrs. Z. E. Robertson.

Eastport, Maine, brags of being furthest east. The town fathers of Bay are going to change the name of their hamlet to Westport, and take their place in the hall of fame.

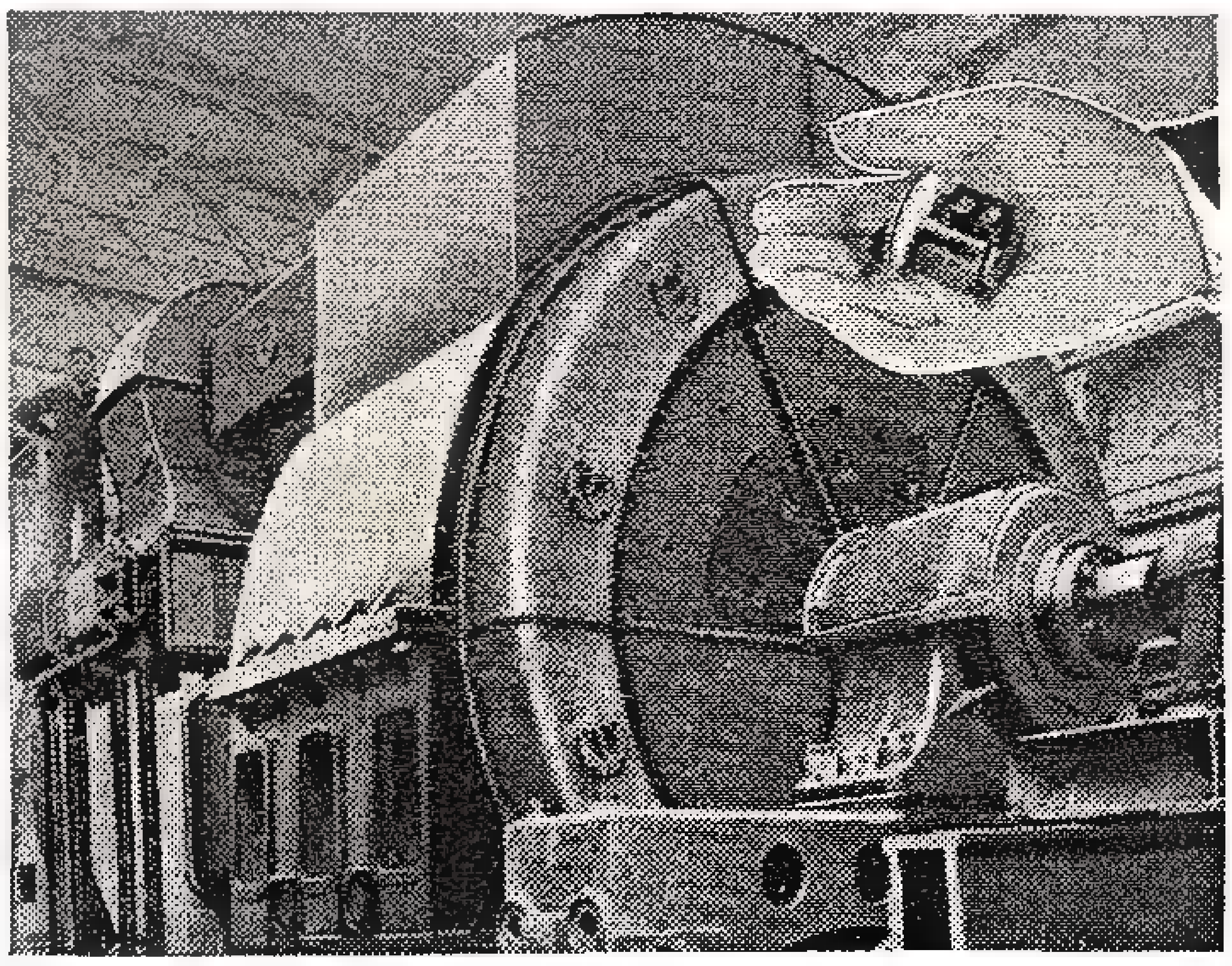
The longest straight telephone call in the country is from Eastport, Maine, to Bay. Only one such call has ever been recorded.

"Normandie" Has Largest Motors

THE largest electric motors in the world, four 40,000 horse power electrical giants, will be installed in the new French liner, *Normandie,* a ship which when built will be the largest vessel in the world. They will drive the ship at 30 knots per hour.

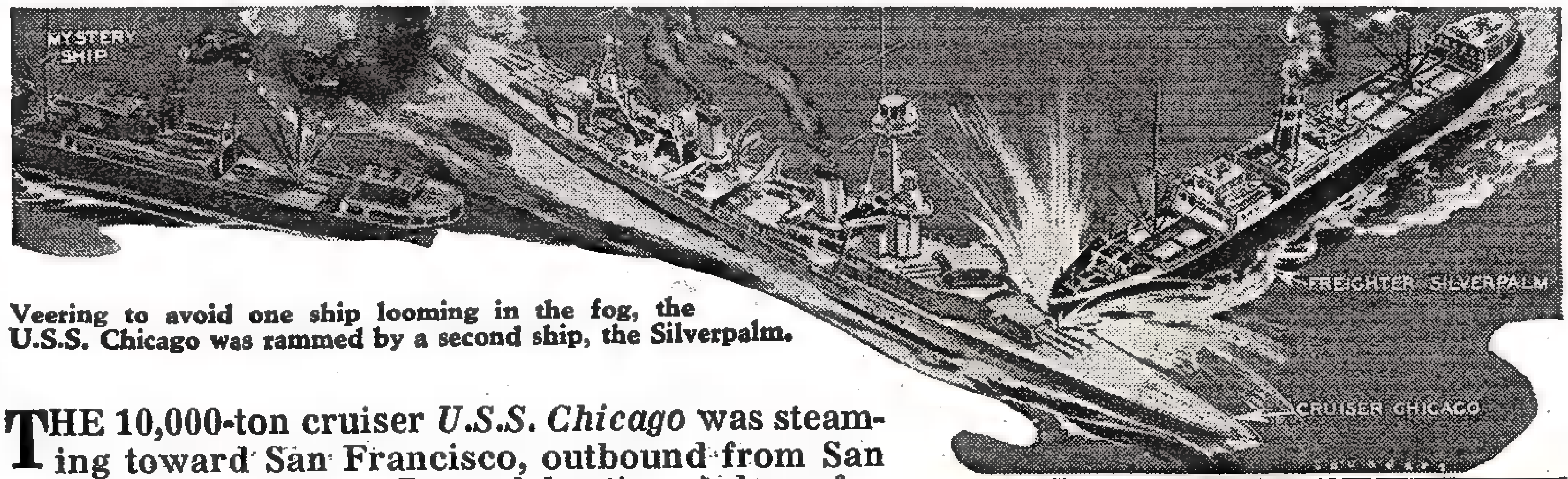
The largest motors in any American vessel are those installed in the airplane carriers, U.S.S. *Saratoga* and U.S.S. *Lexington,* and are rated at about 22,000 horsepower.

These motors form a vivid contrast to the tiniest motor, used in delicate electrical meters, which is rated at .00000033 h.p.



Largest and smallest in electric motors—the gigantic 40,000 horsepower motors being installed on the French liner, "Normandie," and the tiny unit used in electric meters.

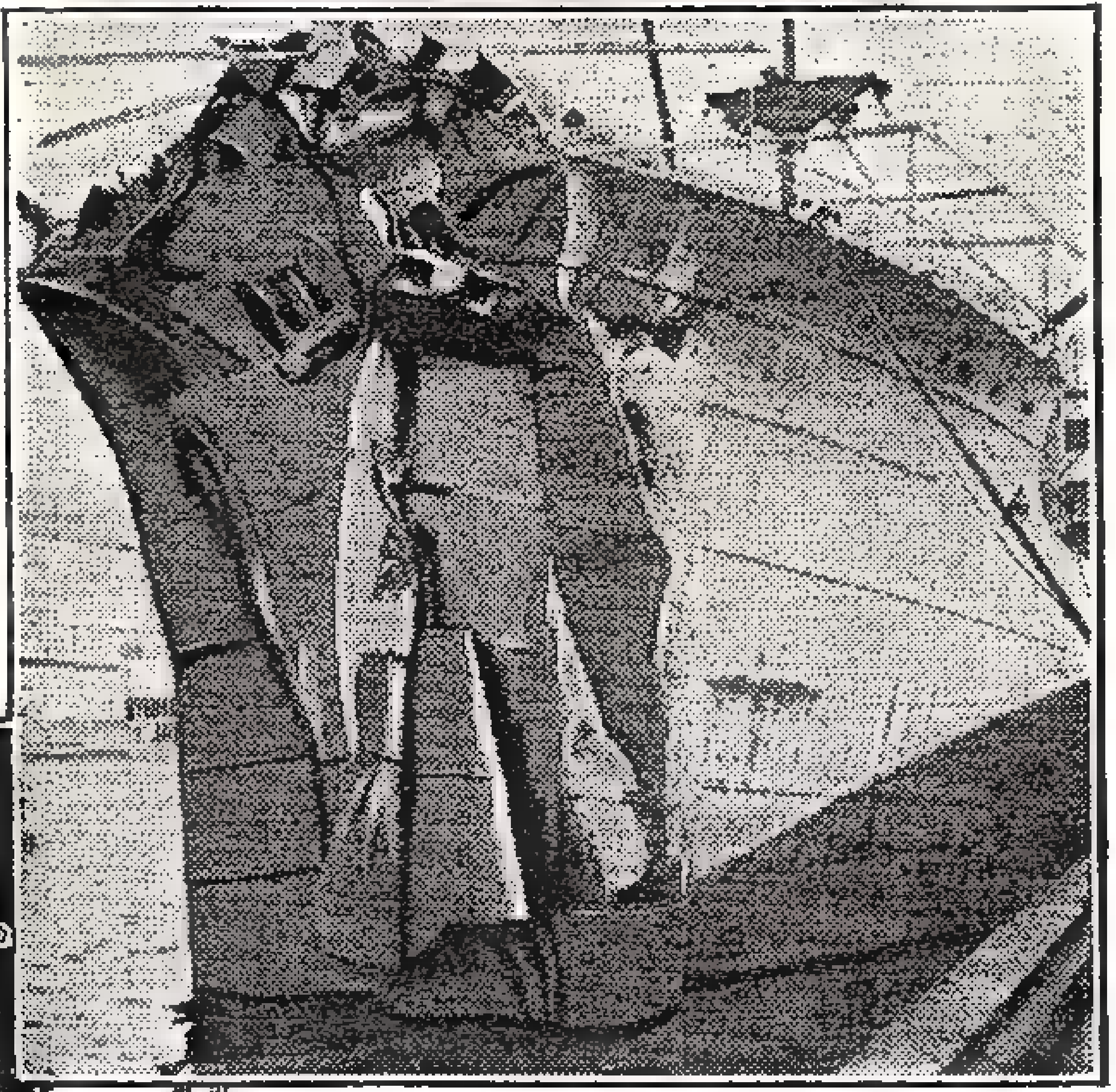
"Tin Plate" Cruiser Loses Skirmish With Tramp Steamer



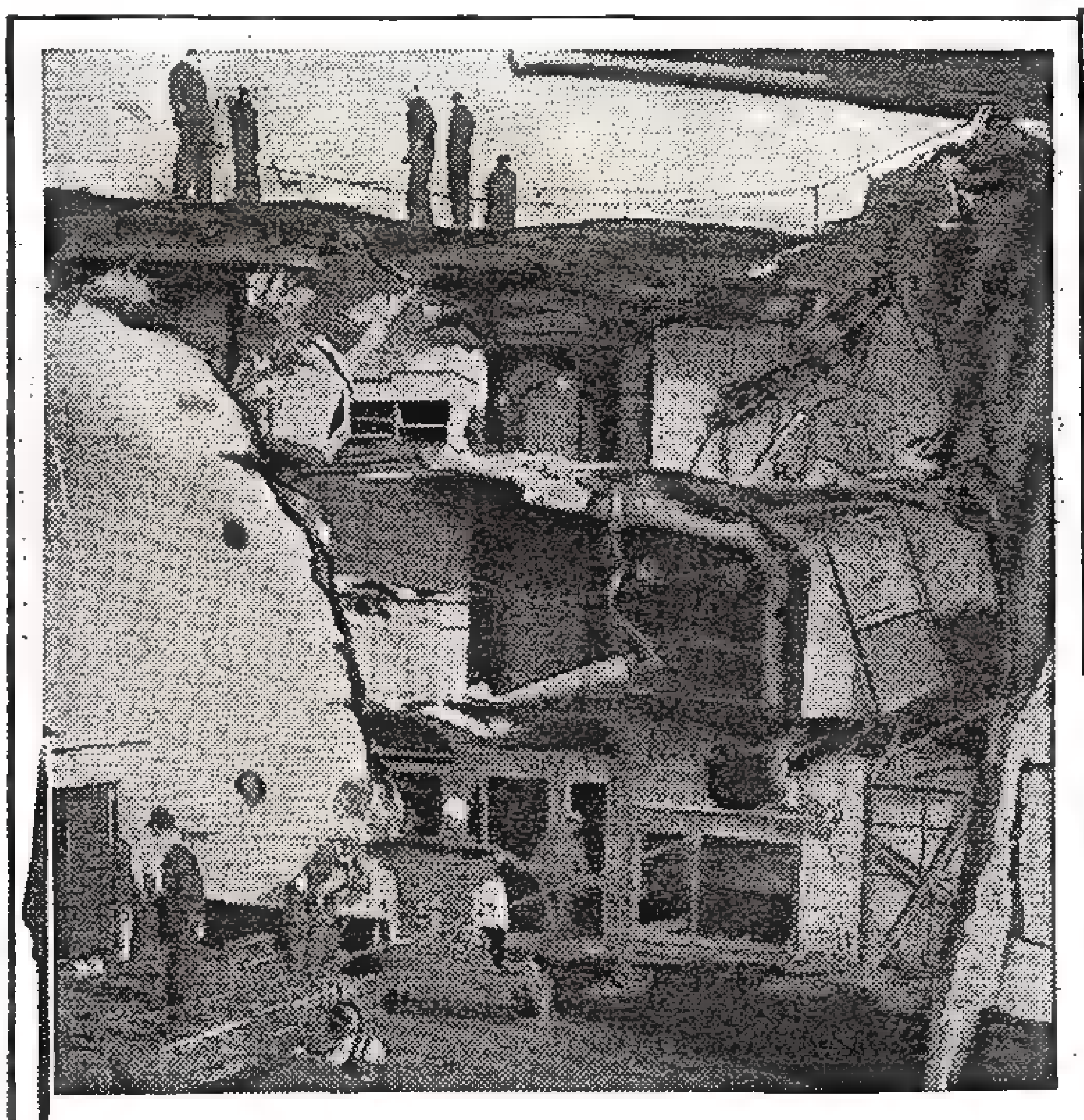
Veering to avoid one ship looming in the fog, the U.S.S. Chicago was rammed by a second ship, the Silverpalm.

THE 10,000-ton cruiser *U.S.S. Chicago* was steaming toward San Francisco, outbound from San Pedro to join the Navy Day celebration. A dense fog enveloped her off Point Sur, 110 miles south of her destination. A large ship suddenly appeared across the *Chicago's* bows, miraculously passing without colliding as the *Chicago's* engines were backed.

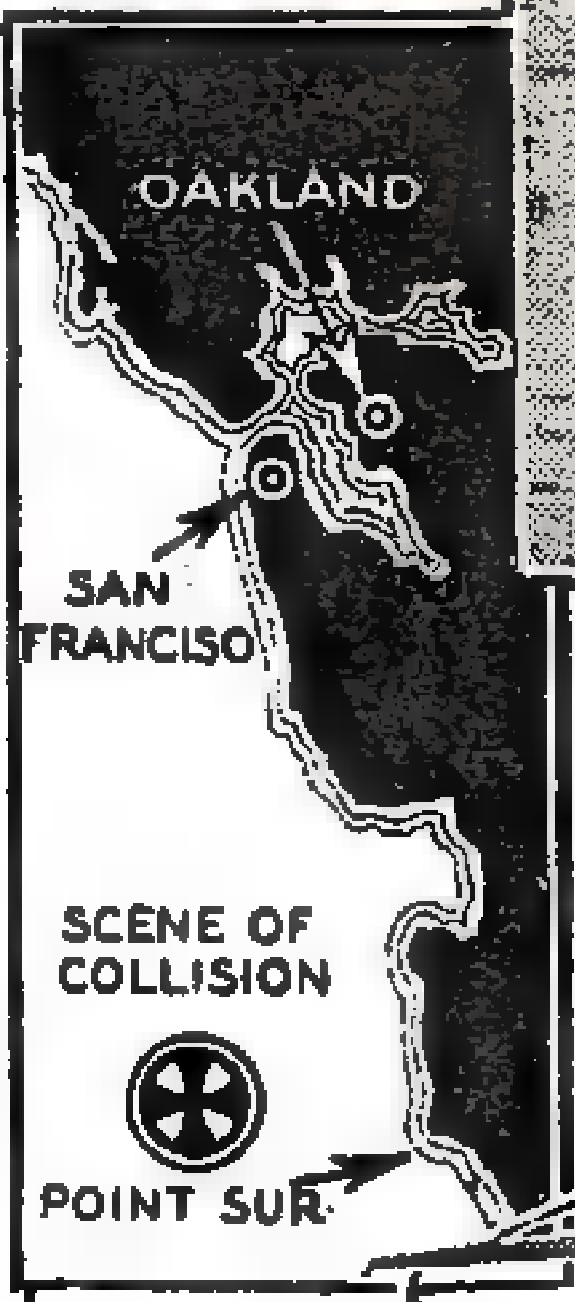
Hardly had the *Chicago* gotten under way when the British 6,000-ton freighter, *Silverpalm,* came plowing down on her out of the fog. Both ships tried to stop to no avail. Result: 3 men crushed to death on *Chicago;* 18-foot hole ripped in light plating of cruiser, bow of tramp rolled up few feet.

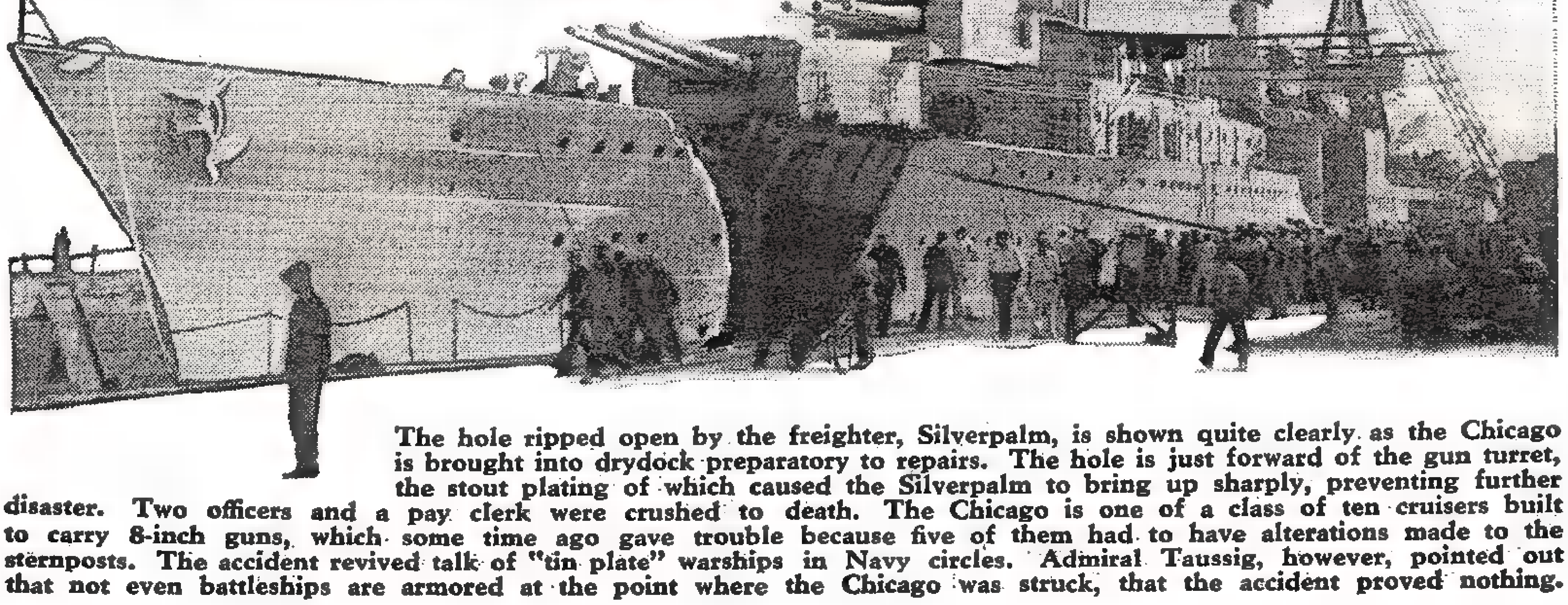


The bow of the British freighter, Silverpalm, after the collision. Because the shock was absorbed end on, damage is not unusually heavy.



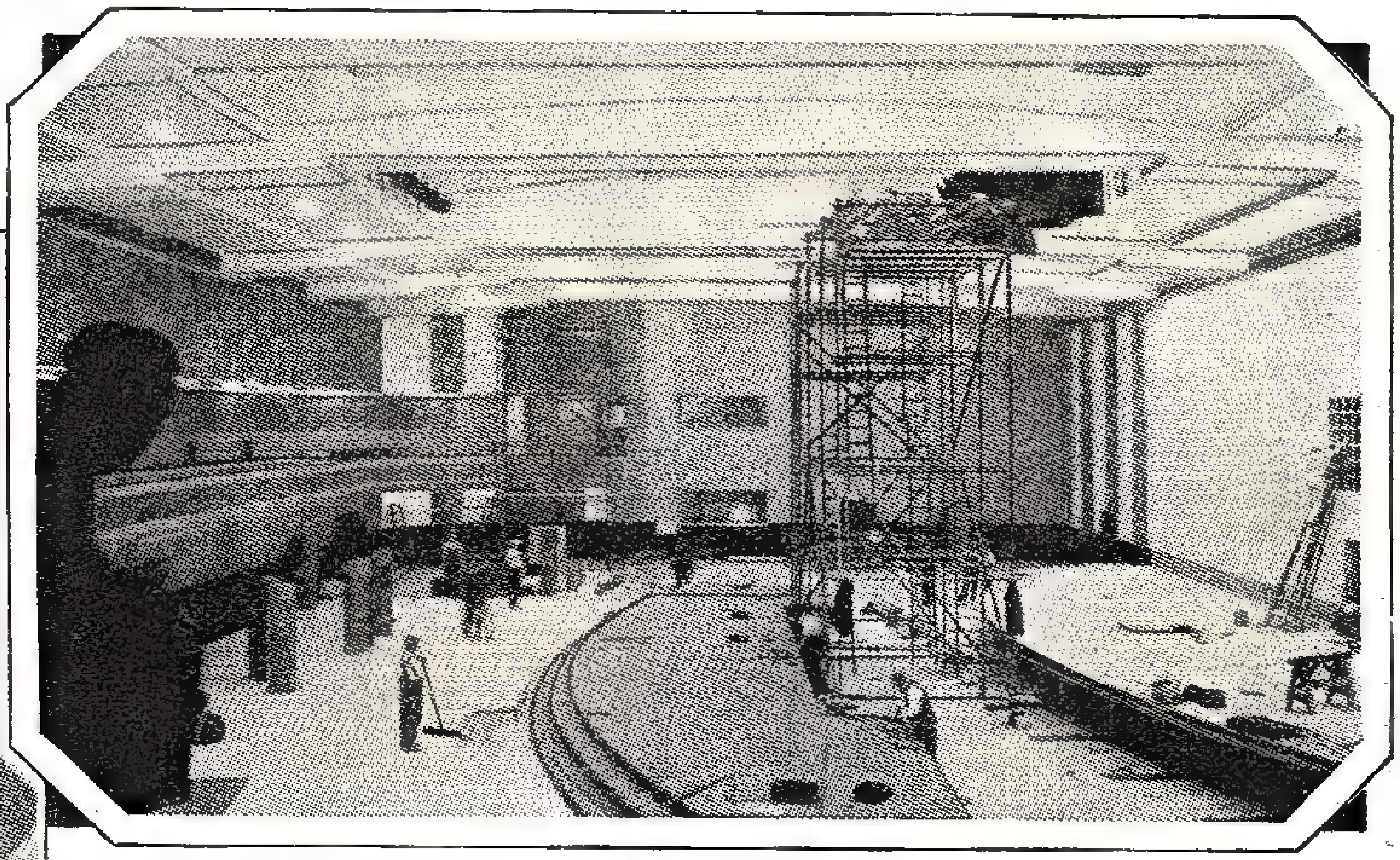
Three men met death as this hole was ripped open.



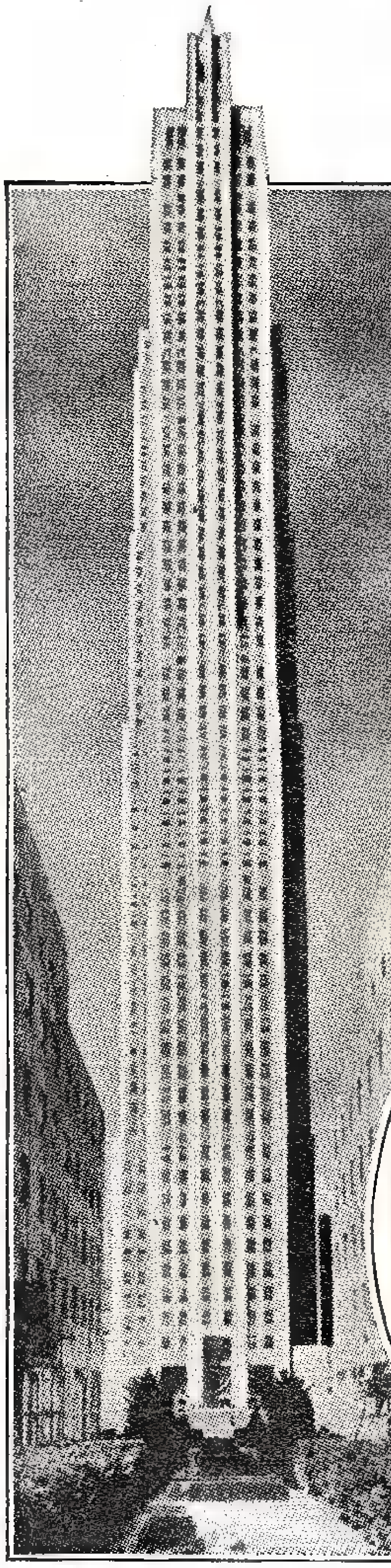


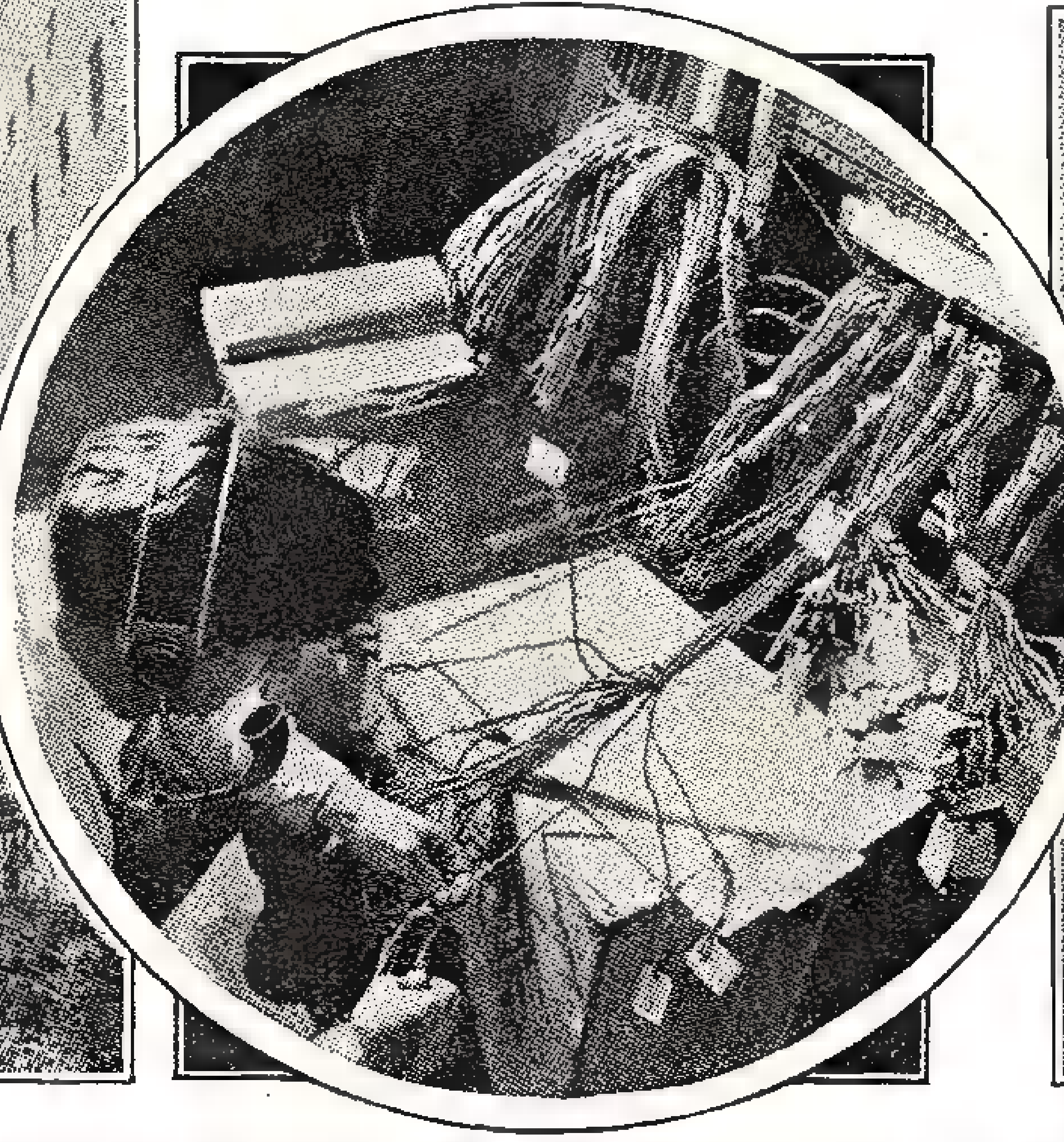
The hole ripped open by the freighter, Silverpalm, is shown quite clearly as the Chicago is brought into drydock preparatory to repairs. The hole is just forward of the gun turret, the stout plating of which caused the Silverpalm to bring up sharply, preventing further disaster. Two officers and a pay clerk were crushed to death. The Chicago is one of a class of ten cruisers built to carry 8-inch guns, which some time ago gave trouble because five of them had to have alterations made to the sternposts. The accident revived talk of "tin plate" warships in Navy circles. Admiral Taussig, however, pointed out that not even battleships are armored at the point where the Chicago was struck, that the accident proved nothing.

The MAGIC Palace of RADIO CITY



This auditorium is 72 feet wide, 132 feet long and is nearly 60 feet high. It is the largest studio in the world. The stage is not only reversible from end to end of the studio, but can be adjusted to accommodate exactly the right number of artists. Walls were covered with fabrics specially woven for the service.





The central tower, or RCA building, is 70 stories high, rising 836 feet above the street. The view shown is taken from the garden on the roof of one of the skyscrapers adjoining the group. Center shows a maze of wires, the hooking of which was a major feat in itself. Right shows air control boards which supply changed air to the studio floors, which have no windows.

JUST a few weeks ago in a building covering three New York City blocks from Forty Eighth to Fifty First street, tycoons of the electrical, radio, motion picture, entertainment and art world sat down in company with 1200 select guests to dedicate the completion of the Rockefeller financed monument to the 13 year old industry of broadcasting—Radio City.

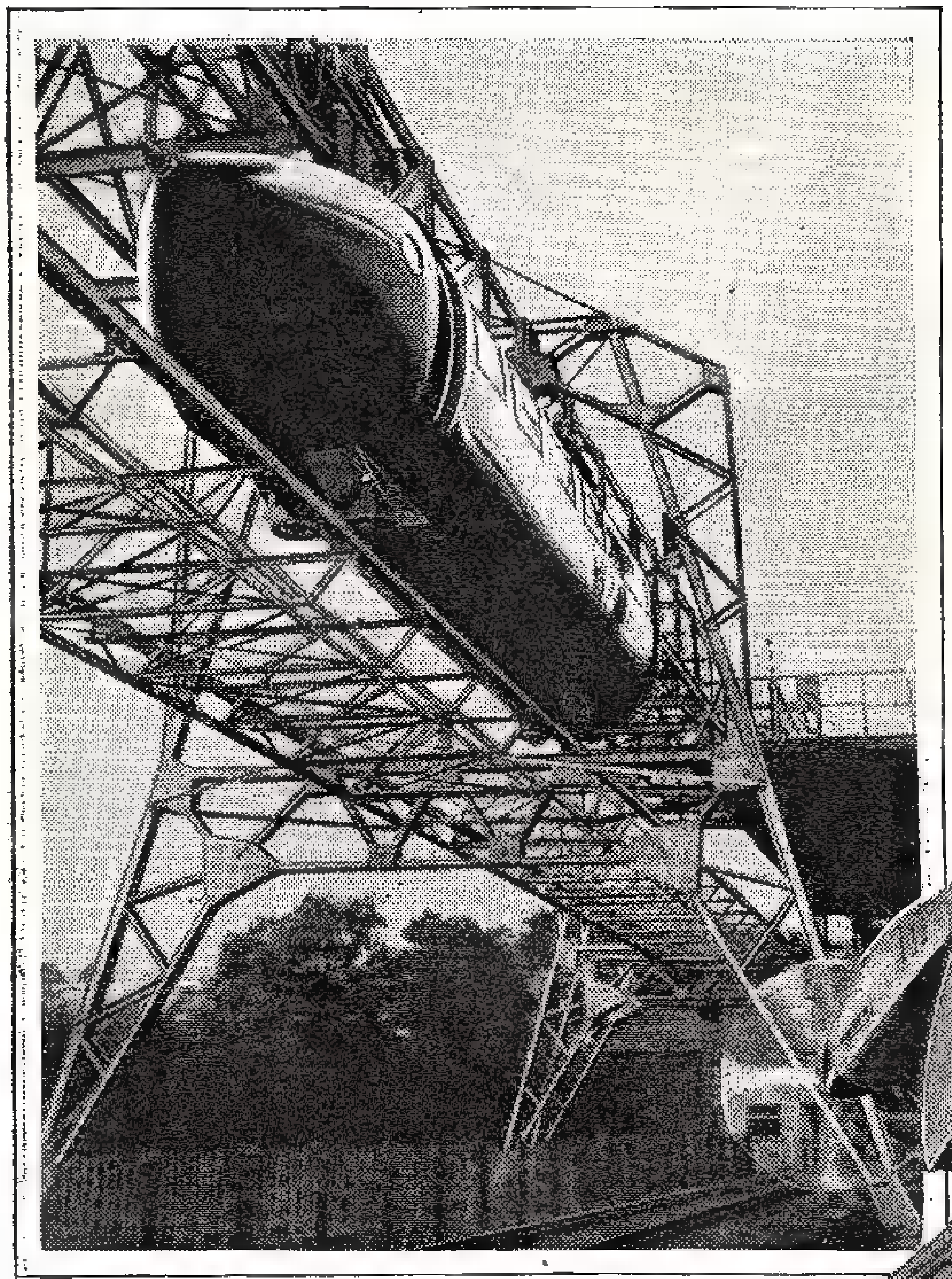
Built to accommodate and anticipate rapidly outgrown and outgrowing needs of the broadcasting industry, this modern engineering wonder tops all superlatives. The industry it represents has grown the fastest toward national import, in the shortest space of any industry of our time. The first national broadcast occurred but 13 years ago when Dr. Frank Conrad, of the Westinghouse Electric and Manufacturing Company put on the air the events of the Harding election from station KDKA, set up informally in his garage in Pittsburgh. The building is our biggest, has the most "mosts."

So gigantic has the radio broadcasting industry become that the need for housing the nationally important broadcasting companies, with their attendant production and executive offices, has called for the building of this skyscraper group in the heart of midtown Manhattan. Over 22,000 people is the potential tenancy of the "City." As they go about their daily work in connection with the business of broadcasting—these people equal the population

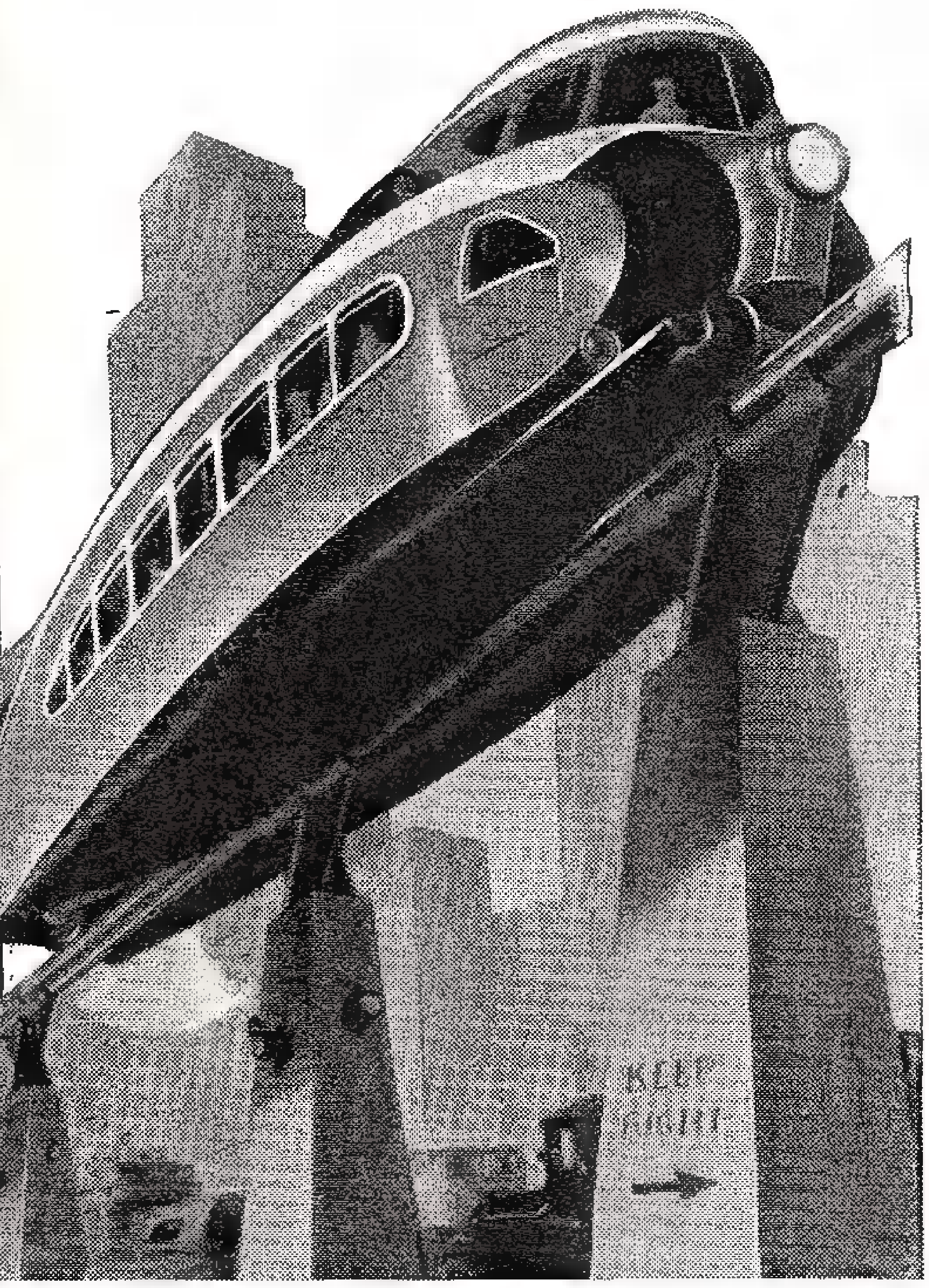
(Continued on page 133)

Gyroscope Monorail Car to

This German monorail will revolutionize rail transportation. At 300 miles per hour it will meet the challenge of the air transport lines.



The monorail car above has just been developed in England to provide fast transportation as a substitute for street car systems. Driven by propellers fore and aft this monorail developed a speed of 100 miles an hour in a demonstration near Glasgow. Guide rail prevents side sway.



Engineer Buchardt's improvement over the English monorail is shown above. For street transport systems large steel structures would be unnecessary. Gyroscopes would eliminate a guide rail to stop side sway. Greater speed is possible.

RAILROADS may challenge the increased popularity of air travel by developing a superspeed monorail car. Balanced by gyroscope and controlled by radio, the gyroscope monorail would be capable of more than 300 miles an hour, its inventor claims.

The gyroscope, not a modern invention, has only recently been applied to transportation. It steadies ships in storm tossed seas. It aids in the automatic control of airplanes in flight.

Applied to rail transportation, the gyroscope will permit much greater speed without sacrificing safety. In fact, Raymond C. Buchardt, engineer of the Telefunken company, of Germany, who designed the gyroscope monorail, claims his superspeed car provides greater safety than is now possible.

Car Stands Upright on Monorail

Buchardt's monorail has all the latest developments in streamlining and makes use of airplane features to guide the car on its single rail. The gyroscope monorail stands upright on its single rail, while present monorails are suspended from the rail.

The gyroscopes are used to balance the car on this single rail. They do away with the side sway that would be present were great speeds attempted with the suspended monorail.

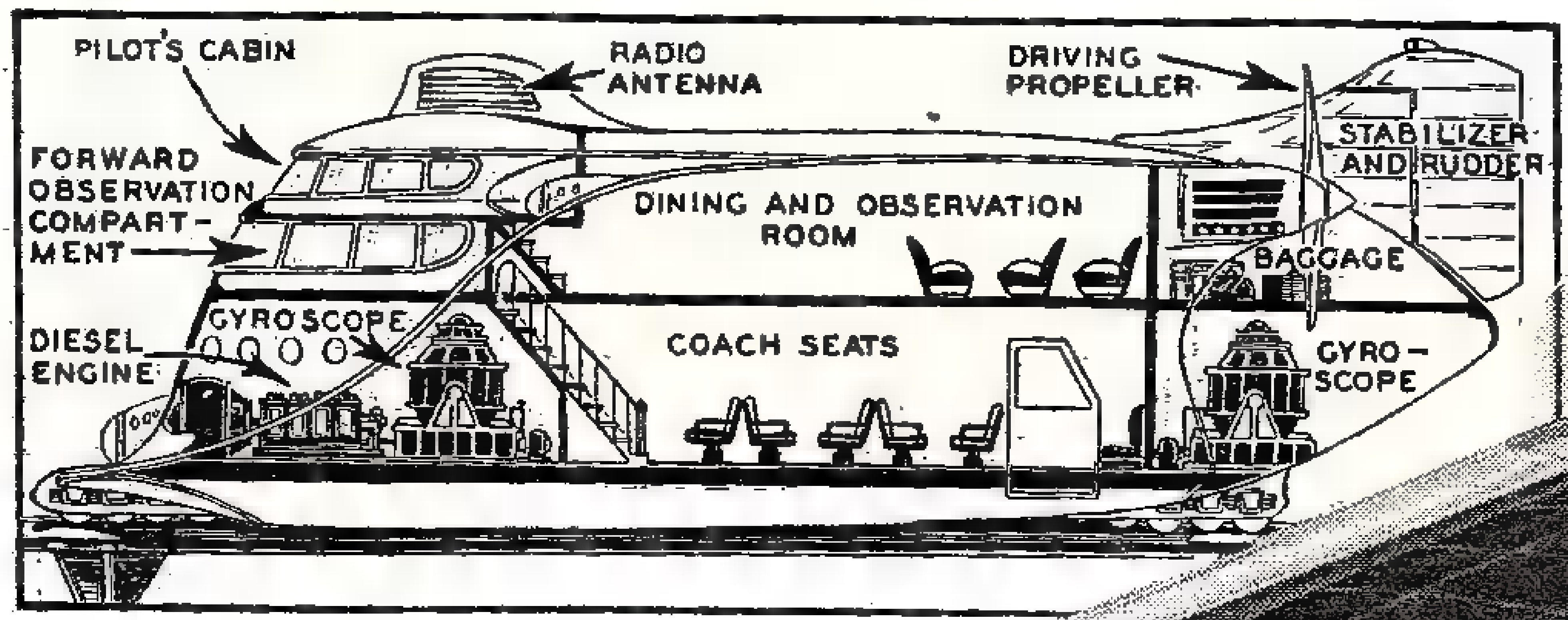
Radio Will Replace Block Signals

"Because of the terrific speed of more than 300 miles an hour, the ordinary block signal will be impossible for the trans-continental monorail," said Mr. Buchardt. "Signals would not be visible and in fog, rain or smoke the vision of the pilot would be entirely obscured.

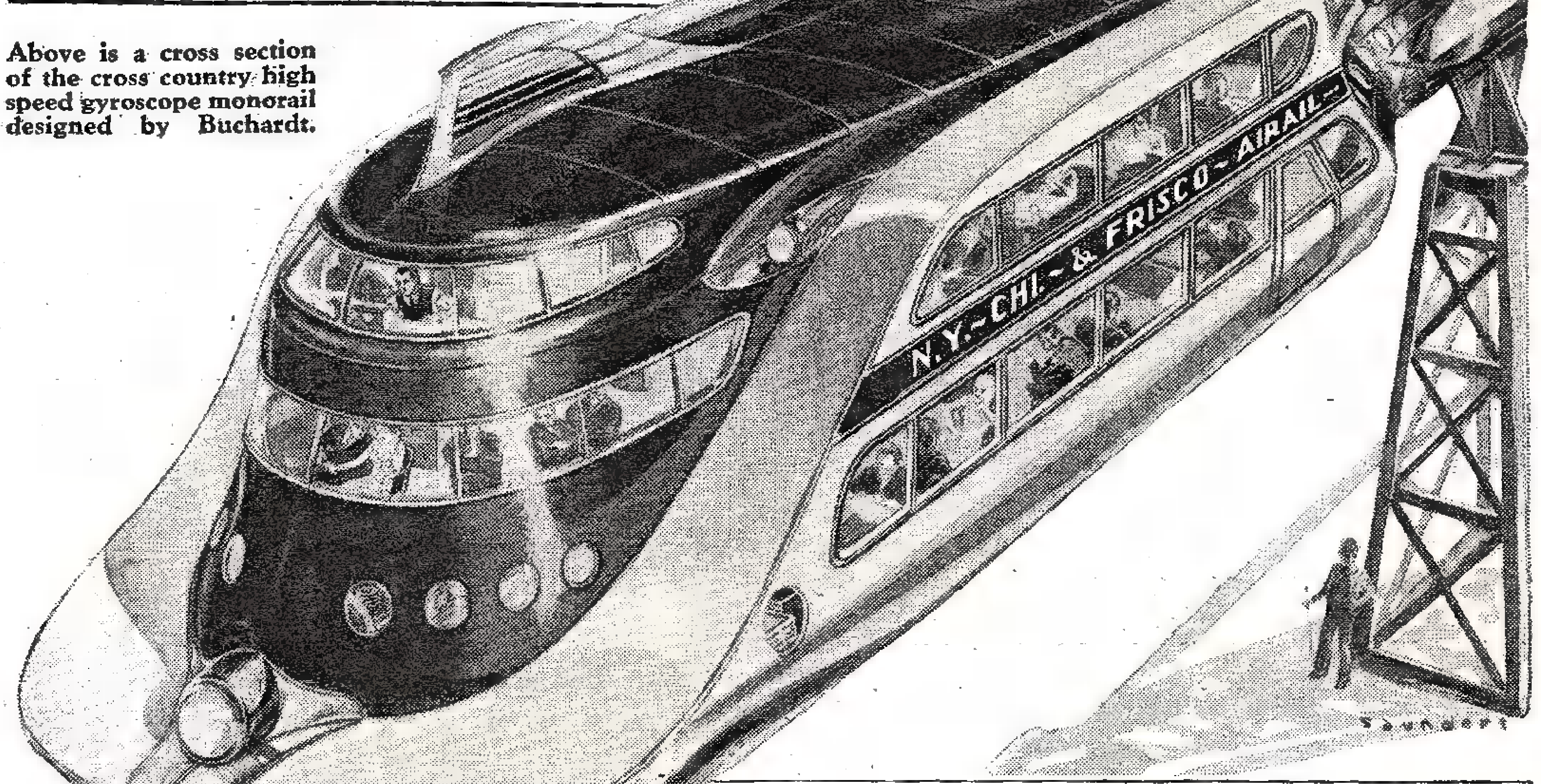
"To meet this difficulty I propose to use the radio to transmit signals and orders to the pilot just as transport planes are now controlled. Radio messages from a dispatcher's office would tell the pilot when to slow up and would warn him of any dangers ahead."

The enormous air pressure created by the great speed would throw an ordinary car from the rail. Buchardt has solved this problem by designing a long, sloping curve

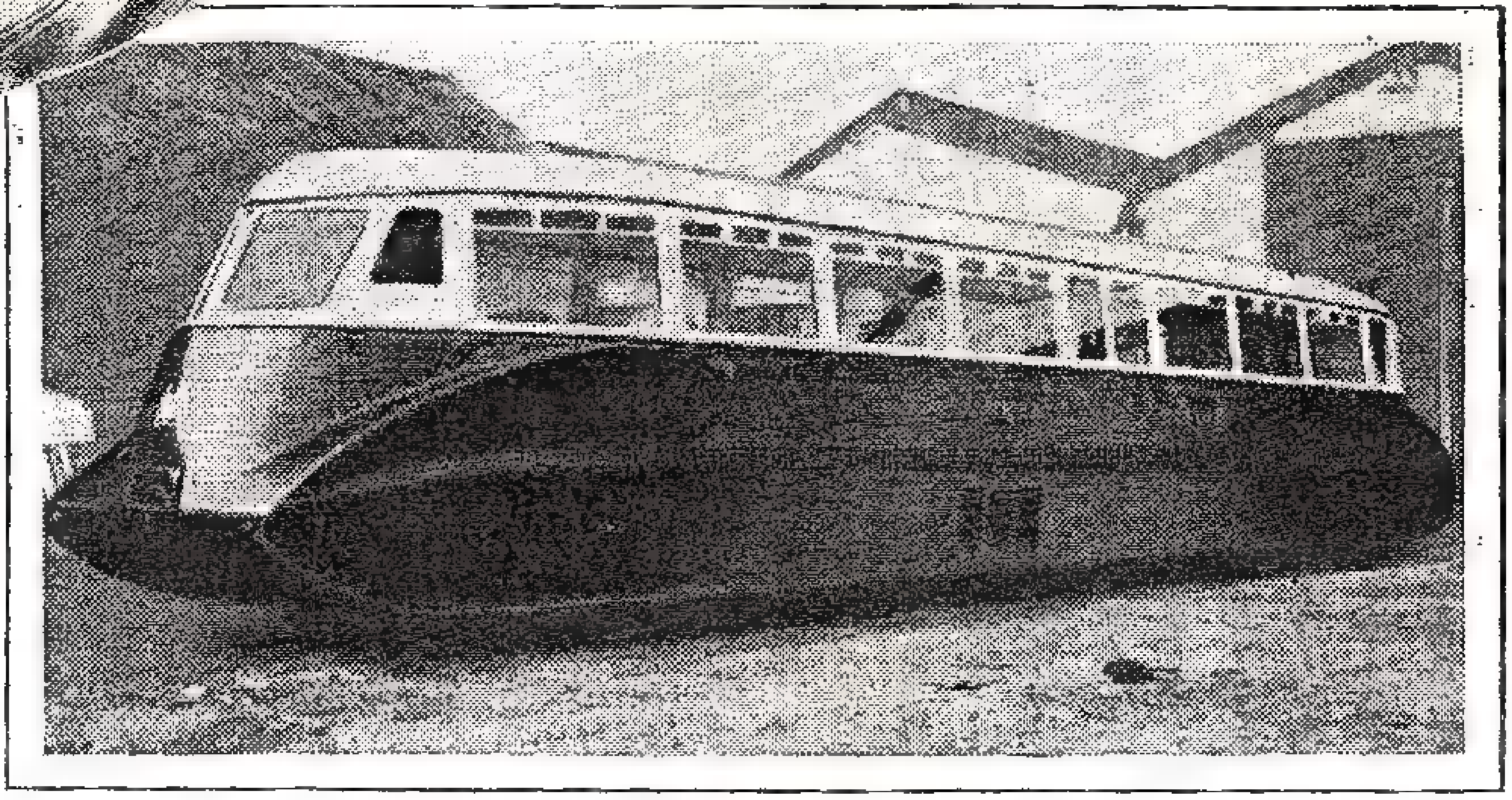
Travel 300 Miles an Hour


PILOT'S CABIN
RADIO ANTENNA
DRIVING PROPELLER
FORWARD OBSERVATION COMPARTMENT
DINING AND OBSERVATION ROOM
STABILIZER AND RUDDER
BAGGAGE
GYROSCOPE
DIESEL ENGINE
COACH SEATS
GYRO-SCOPE

Above is a cross section of the cross country high speed gyroscope monorail designed by Buchardt.


N.Y.-CHI.-& FRISCO-AIRAIL-
SAUNDERS

The 300-mile-an-hour gyroscope monorail is shown in the artist's drawing above. The long forward sloping planes hold the car to the rail. Radio signals would guide pilot.



This latest railroad car design follows the streamlining used on the gyroscope monorail. This English rail car attained a maximum speed of 60 miles per hour.

on either side of the car, which he calls a "wind catcher." The air pressing against this "wind catcher" would hold the car on the rail.

In his experiments with his invention, Buchardt found that the monorail would have trouble taking curves. The car took the curve perfectly, but the centrifugal force nearly threw it off the rail after completing the curve.

For that reason stabilizing fins were placed at the front and rear of the car along with a large rudder. The forward fin also houses the radio antenna.

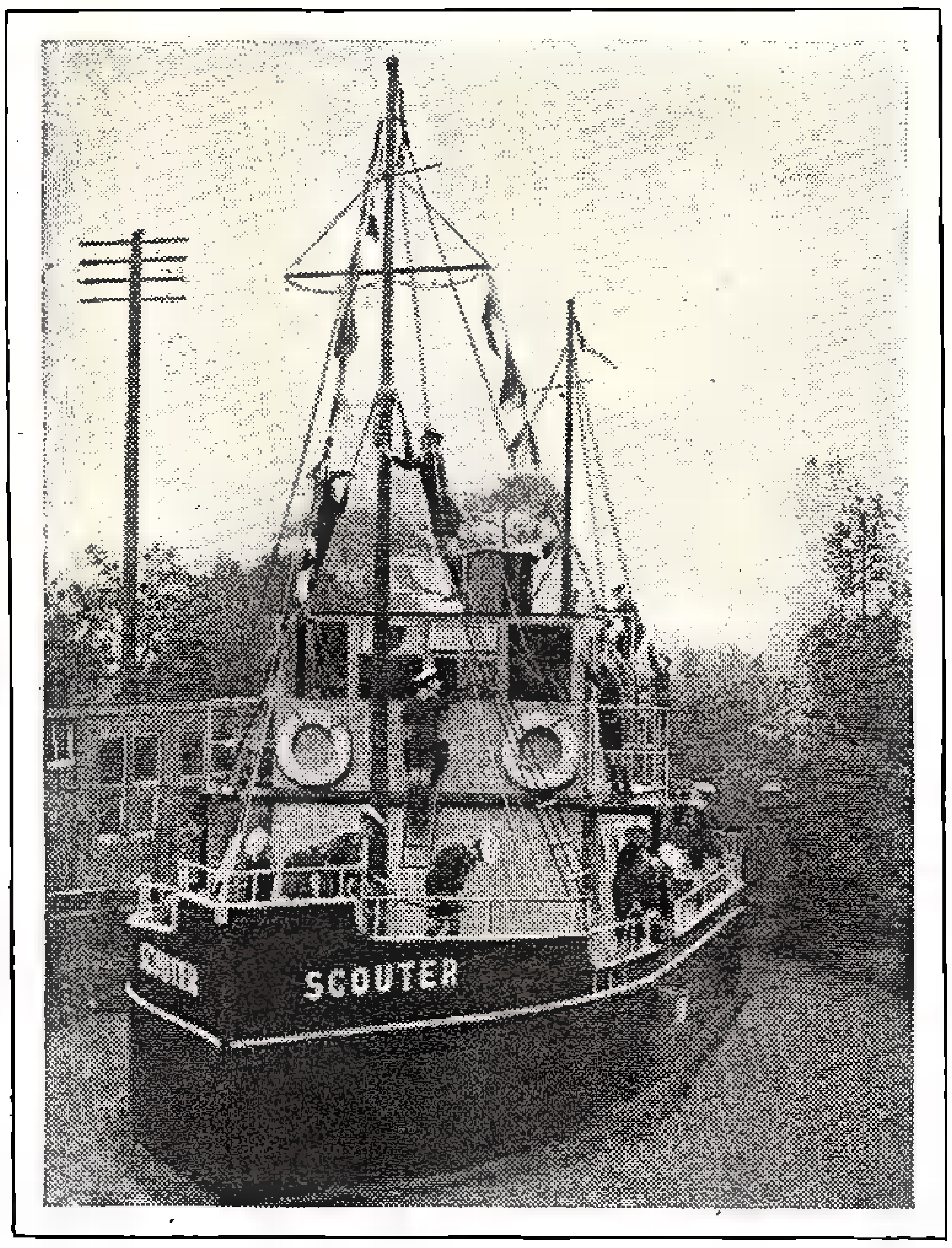
The gyroscope car is driven by two large propellers at either side of the rear end of the car. One gyroscope would be housed in the forward end of the car and the other in a rear compartment. Power would be supplied by Diesel engines.

The rail used would be round and the wheels curved in such a way as to form a ball link.

The traction system type of monorail would be much smaller than the car used in cross country runs. The latter would be a double-decked car with the pilot housed in a third deck forward.

The trans-continental type would carry approximately 100 passengers.

Sea Scouts Receive Training in This Novel Backyard Ship



Sea Scouts of an English school have constructed this 58-foot training ship, complete with powerful wireless equipment, on their school lawn for use as troop headquarters.

A COMPLETELY rigged 58 foot ship, berthed on the lawn at the back of an English school, is headquarters and training ship for the Rose Hill Sea Scouts of Tunbridge, Wells.

The headmaster of the school, R. Saunders-Johnson, is Scoutmaster and designer of the ship. The group of Sea Scouts started construction in 1927, making the ship exactly like an ocean-going vessel. It has masts, rigging, life-buoys, ship's compass, and a powerful wireless transmitter.

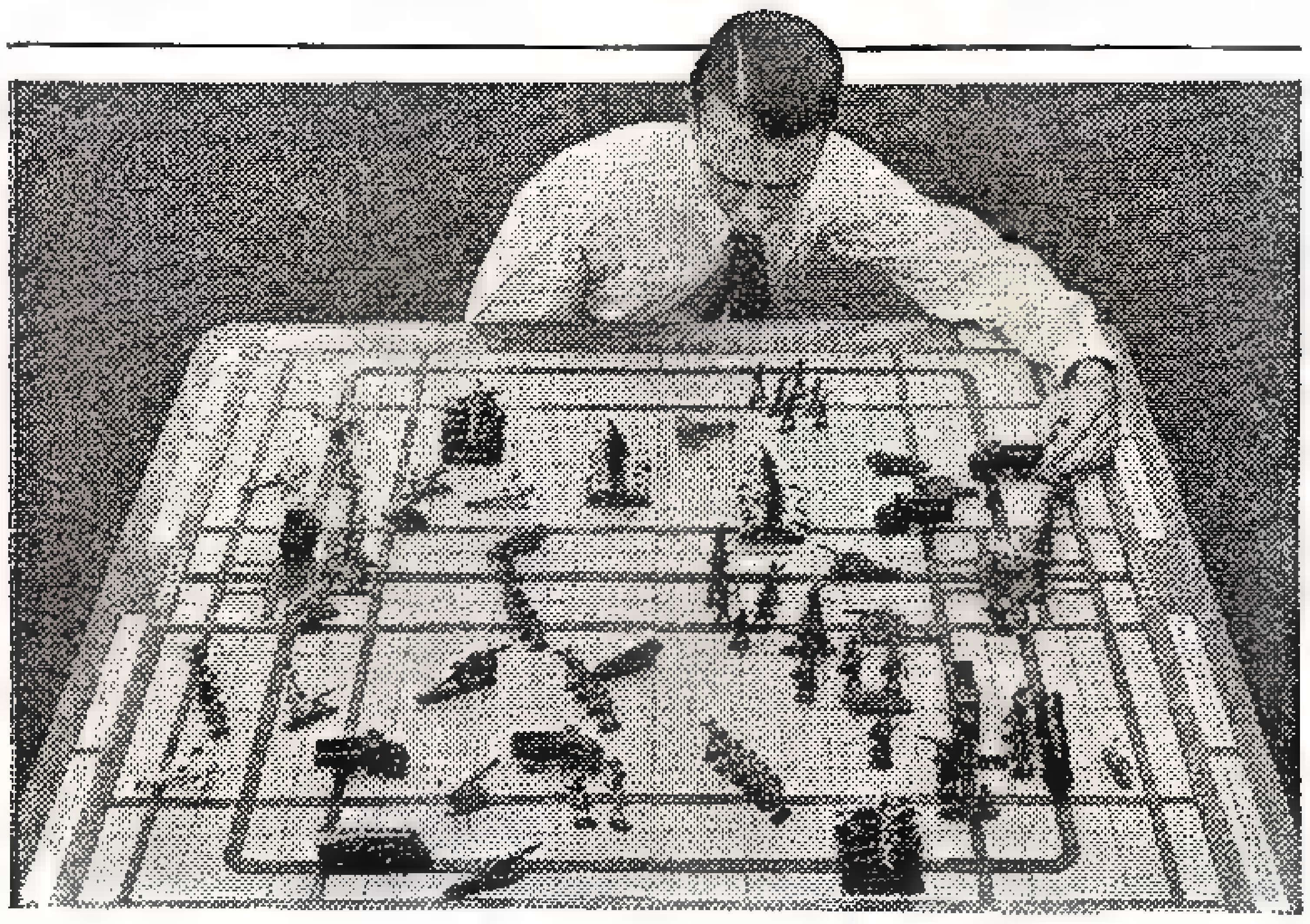
Additions are still being made to the equipment, and improvements worked out for the wireless apparatus.

Scouts follow the strict routine of sea life when on the land-ship, even to the extent of scrubbing down the decks and polishing the brass work. They receive a nautical training which, because of its safety, is finding great favor with parents.

Tanks, Guns Used in 'Battle' Game

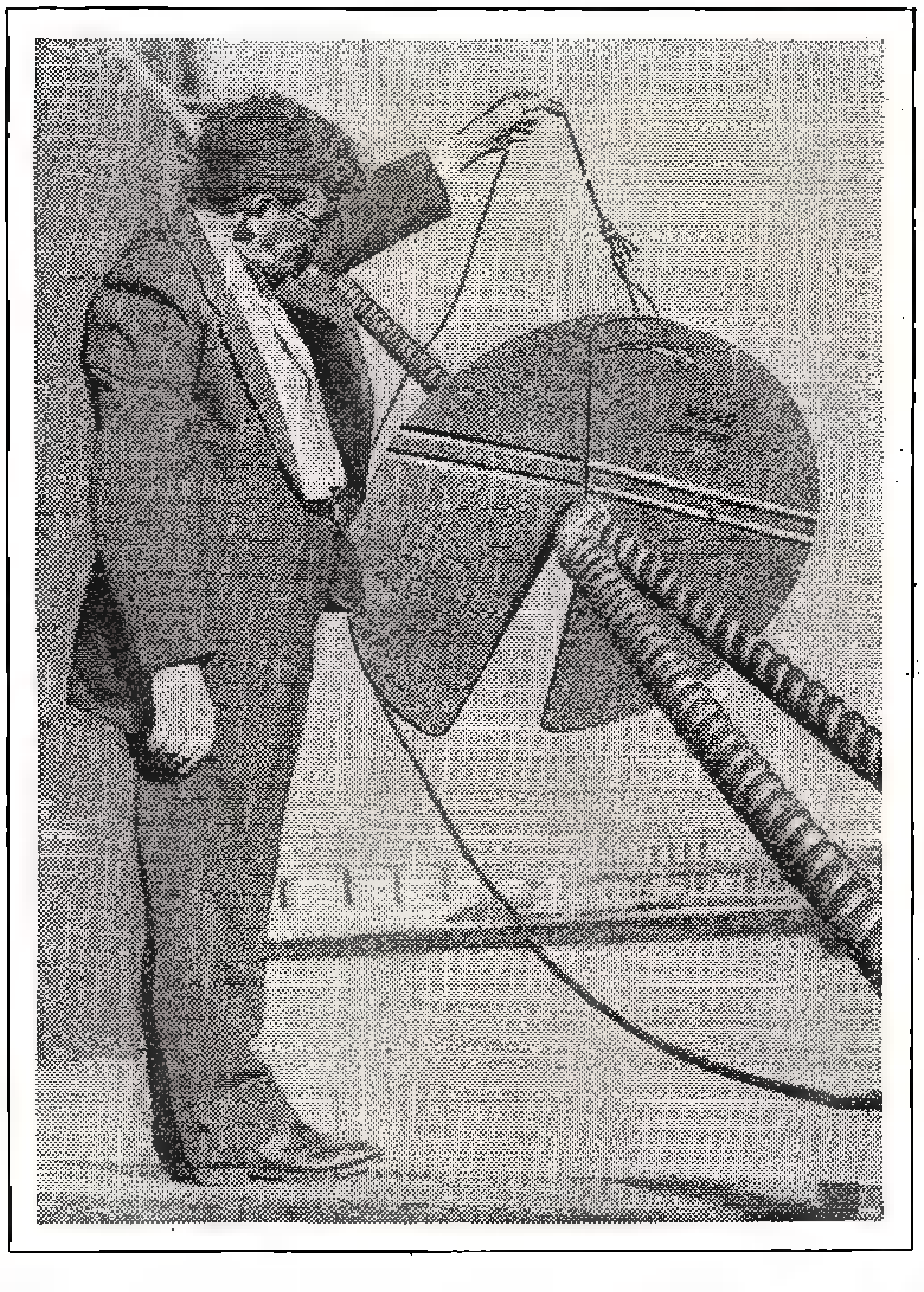
TIN soldiers of childhood have grown up and, supplemented by miniature tanks, guns, and airplanes, are making the exact tactical maneuvers of actual warfare in "Battle," a new war game recently introduced in Hollywood by Dale Van Every, noted war author.

The game includes surprise attacks, frontal charges, cavalry raids, artillery barrages, air bombing, and all other maneuvers of modern warfare. The playing board is divided into two halves, so that opposing "generals" can prepare their forces for battle out of sight of each other.



In the new "Battle" game, opposing "generals" line up their forces secretly and move miniature tanks, planes, guns, and soldiers just as in tactical maneuvers of modern war.

New Guard Keeps Rats Off Ships

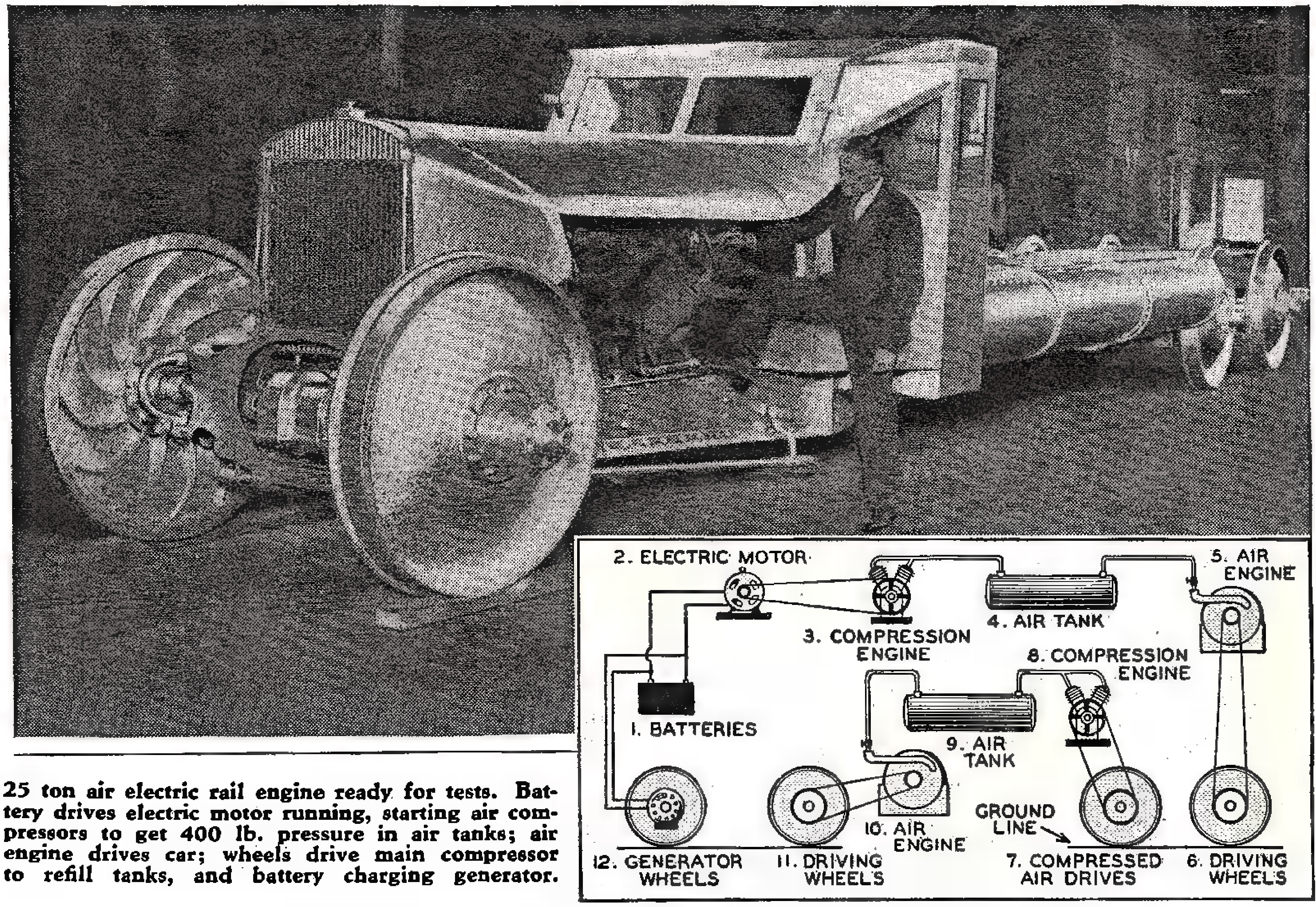


Metal rat guard slides easily over hawsers, preventing the rats from bringing contagious diseases to ships. Rats attempting to climb over guard slip and plunge into water.

A METAL rat guard which can be placed in position on hawsers without leaving the deck of the ship has been developed by W. A. Meade of Los Angeles, and is now being used by more than 40 ship lines.

Keeping rats off of ships is the best known means of preventing the carrying of plagues from one country to another, and of eliminating contagious diseases among the ships' crews.

New Rail Car Runs on Air-Electric Perpetual Drive



25 ton air electric rail engine ready for tests. Battery drives electric motor running, starting air compressors to get 400 lb. pressure in air tanks; air engine drives car; wheels drive main compressor to refill tanks, and battery charging generator.

FROM coast to coast by rail in 24 hours, traveling literally on air—that is what W. E. Boyette of Atlanta, Georgia, claims for his invention, a railroad engine that runs almost entirely on air.

Air for fuel—speeds of up to 125 miles an hour on rails—low transportation costs—these are possibilities conjured by Boyette's air electric car. After being started by batteries, the car needs only air to keep it running—a close approach to perpetual motion.

Inventor Boyette claims his invention is quite simple, even though it is contrary to all principles of engineering.

Large tanks on the sides of the car are pumped with compressed air by a starting air compressor which is driven by an auxiliary electric motor and 4800 pound storage battery set. Compressed air then operates the air engine connected to the driving wheels, bringing the car up to speed.

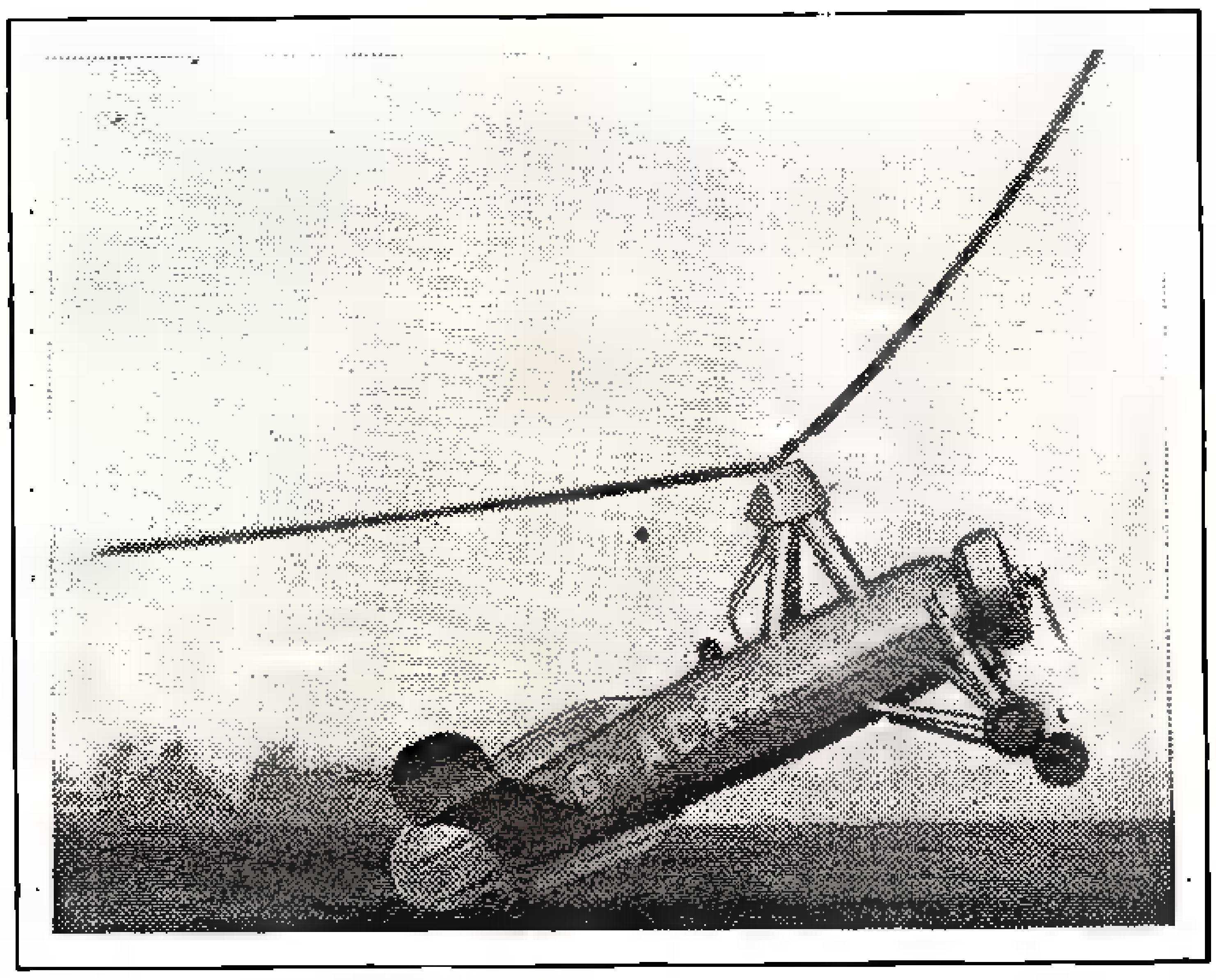
As the car moves, a large air compressor directly connected to the front wheels pumps air back into the tanks. An electric generator connected to the farthest rear pair of wheels is continually charging the batteries. Thus the movement of the car refills the air tanks and partly recharges the batteries.

With the engine pulling two passenger coaches over a 250 mile rail run, it is said that about $2.50 worth of electricity for fully charging the batteries at the end of the run will be the only fuel expense.

"Wingless" Autogyro Is Successful

A WINGLESS type of autogyro plane, designed and constructed by Juan de la Cierva, inventor of this type of aircraft, rose from the ground after a run of but 10 yards in its first test at Hanworth Airport.

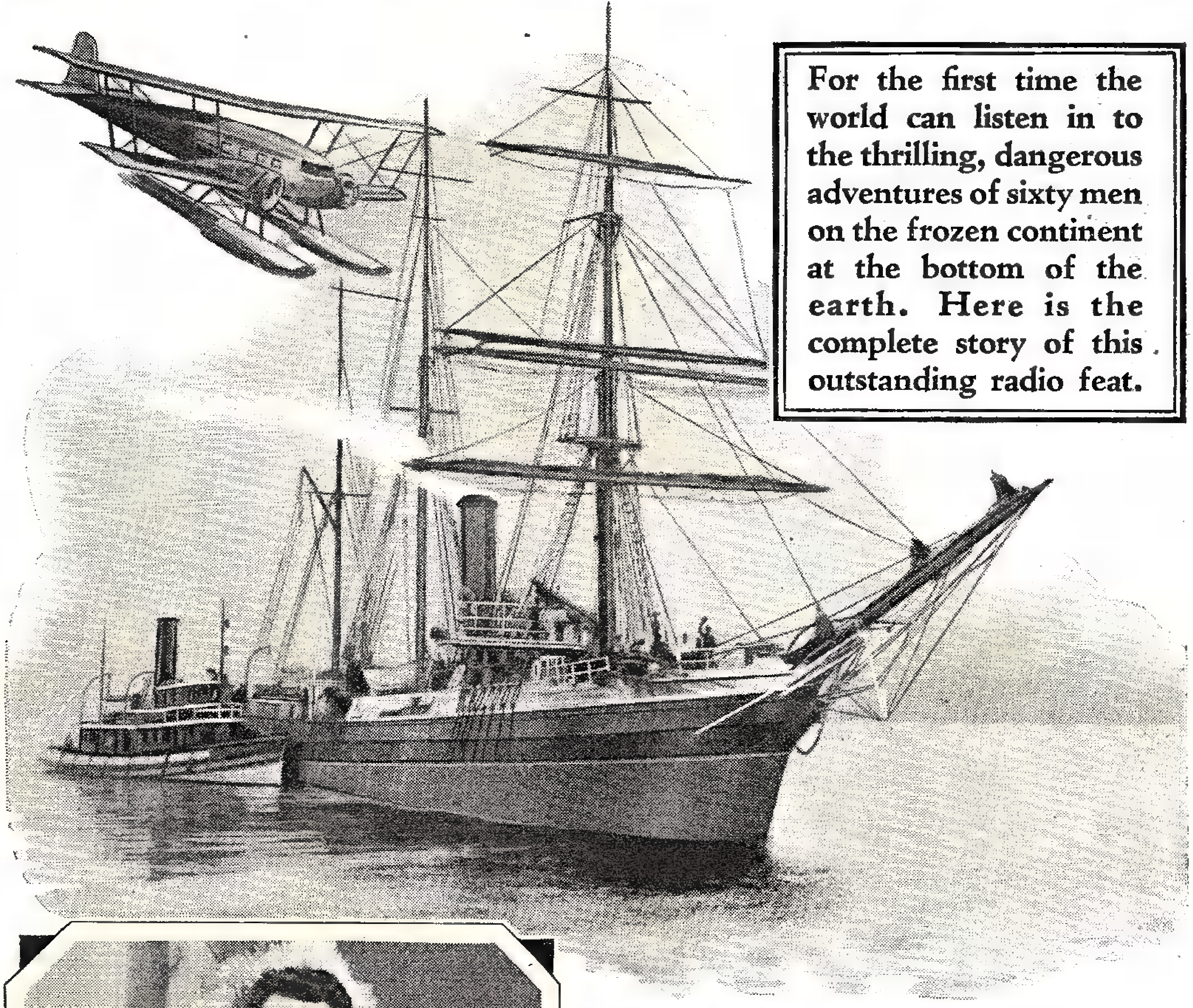
The flying "windmill," absolutely without wings, is supported in the air by the tremendous wing-spread of the horizontal propellers, and driven forward by the customary perpendicular airplane propellers.



Wingless autogyro designed by Juan de la Cierva takes off for its first test at Hanworth Airport. Horizontal propellers replace wings, enabling take-off in 30 feet.

SOUTH POLE Broadcasting

For the first time the world can listen in to the thrilling, dangerous adventures of sixty men on the frozen continent at the bottom of the earth. Here is the complete story of this outstanding radio feat.



The ice breaker, "Bear of Oakland" (above), will be the first of Byrd's ships to reach Little America, where the expedition's largest radio station will be established.

Admiral Byrd, bundled in furs, will broadcast his flight over the South Pole. The rifle will be part of emergency equipment carried in case of forced landings on barren Antarctica.

HISTORY, adventure, thrilling exploration—all these will be enacted at the bottom of the earth when Admiral Richard E. Byrd makes a double conquest of the air.

Over the great sweep of pack ice, the lofty frozen peaks of Antarctica, a giant airplane will roar through a leaden, forbidding sky on another major epoch in the field of aviation.

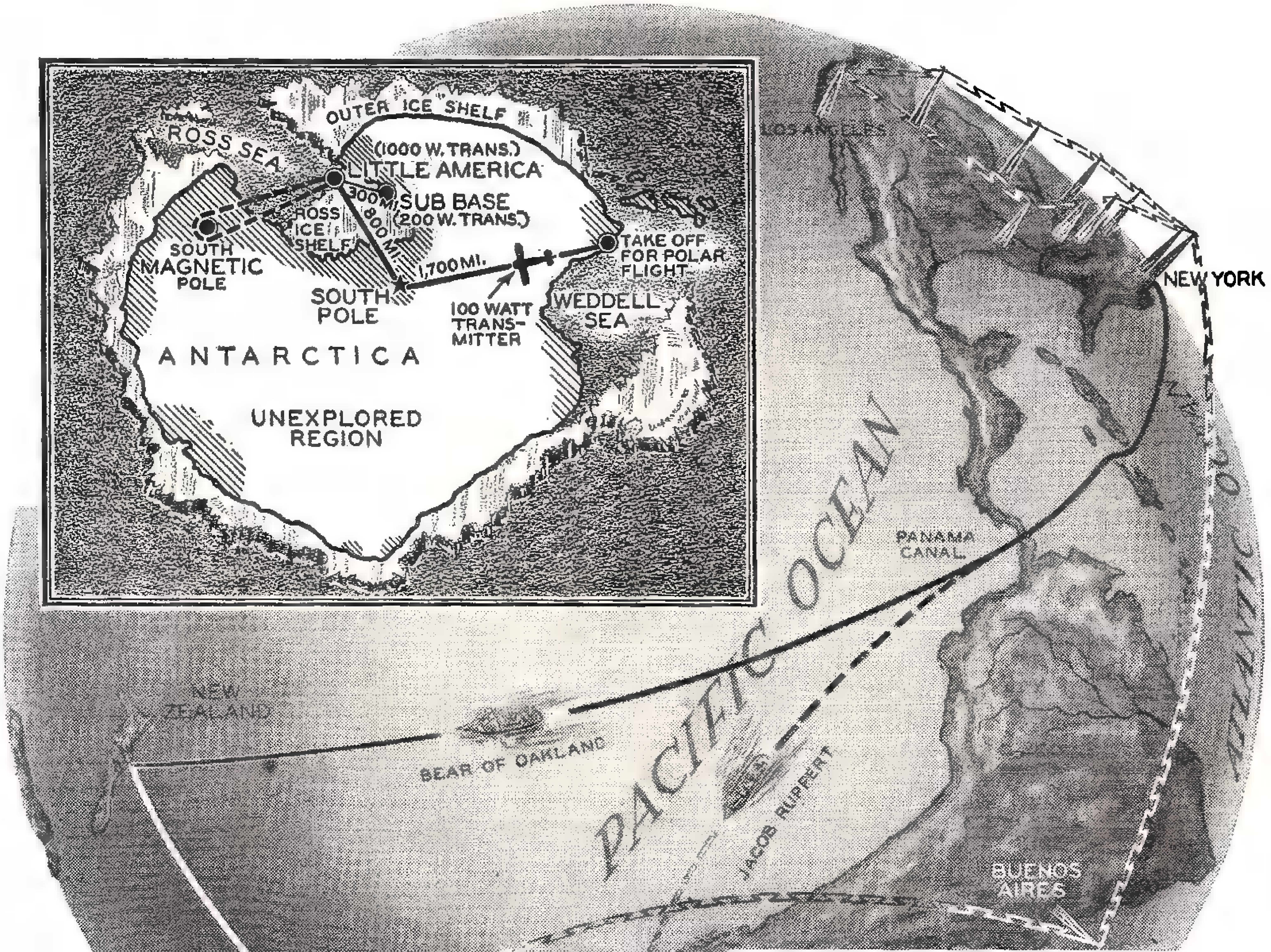
Rescues to Be Broadcast

In the cabin of that plane, a band of daring men, every nerve tense with the excitement of hazardous adventure, will bring to the rest of the world, seated cozily in the comfort of home, a vivid description of the bleak icy wastes of the polar regions.

For the first time in history the South Pole will go on the air in regular radio broadcasting and the world will hear the words: "This is Admiral Byrd speaking to you from the South Pole."

His airplane's little 100-watt station will

—Admiral BYRD Speaking!

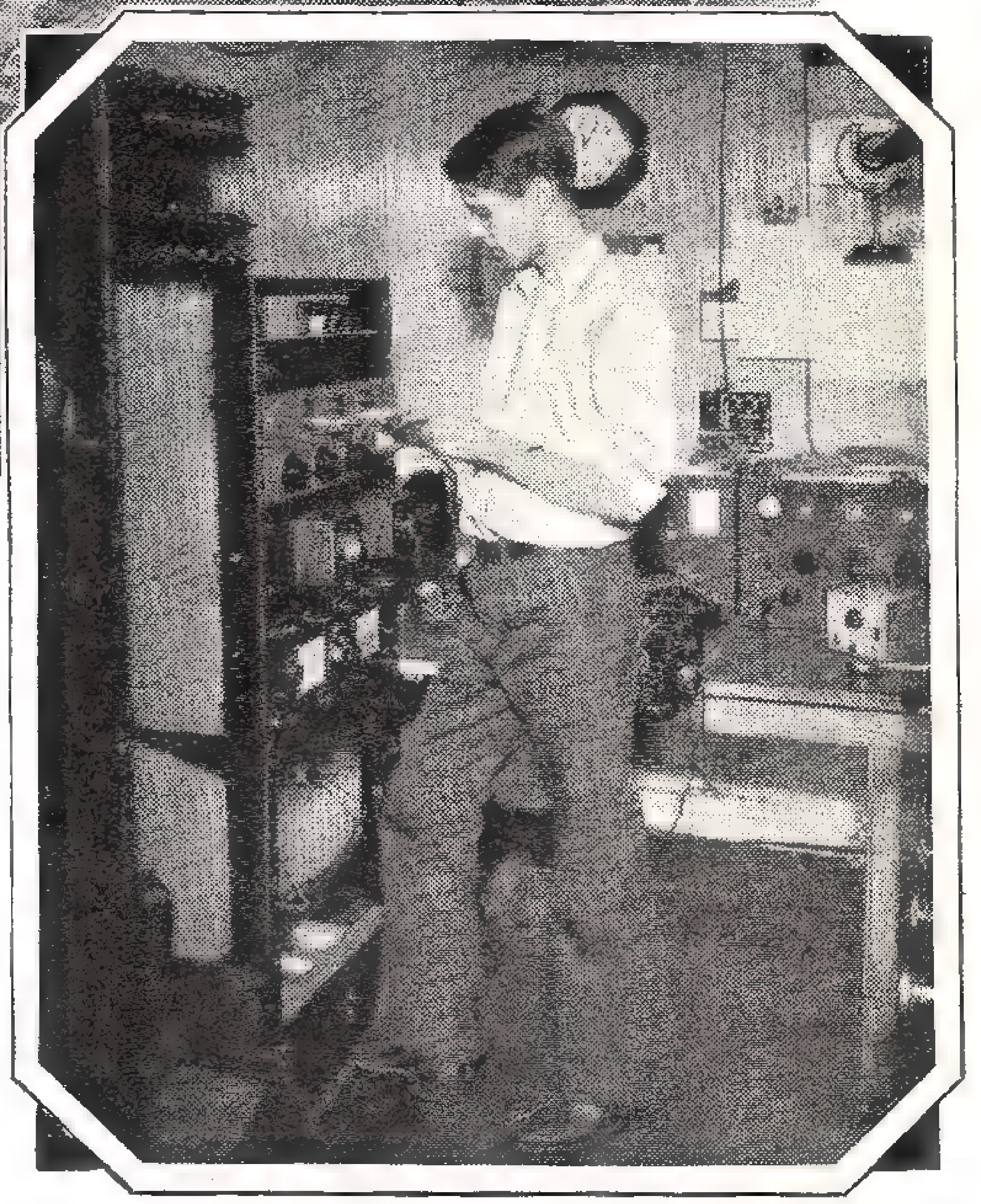

OUTER ICE SHELF
ROSS SEA
(1000 W. TRANS.)
LITTLE AMERICA
SUB BASE
(200 W. TRANS.)
300 MI.
800 MI.
ROSS ICE SHELF
SOUTH MAGNETIC POLE
TAKE OFF FOR POLAR FLIGHT
1,700 MI.
SOUTH POLE
100 WATT TRANS-MITTER
WEDDELL SEA
ANTARCTICA
UNEXPLORED REGION
LOS ANGELES
NEW YORK
PACIFIC OCEAN
PANAMA CANAL
NEW ZEALAND
BEAR OF OAKLAND
JACOB RUPPERT
BUENOS AIRES
LITTLE AMERICA
SOUTH MAGNETIC POLE
SOUTH POLE
WEDDELL SEA
ANTARCTICA

Little America will broadcast 10,000 miles to New York with a relay station at Buenos Aires, as shown in the above map. The "Jacob Ruppert" will take Byrd to Weddell Sea for takeoff on polar flight, later flying to South Magnetic pole. Only shaded areas on inset map have been explored.

send through the ether a program more exciting than the greatest football game, more thrilling than the pulse-stirring race of the finest thoroughbreds of the turf.

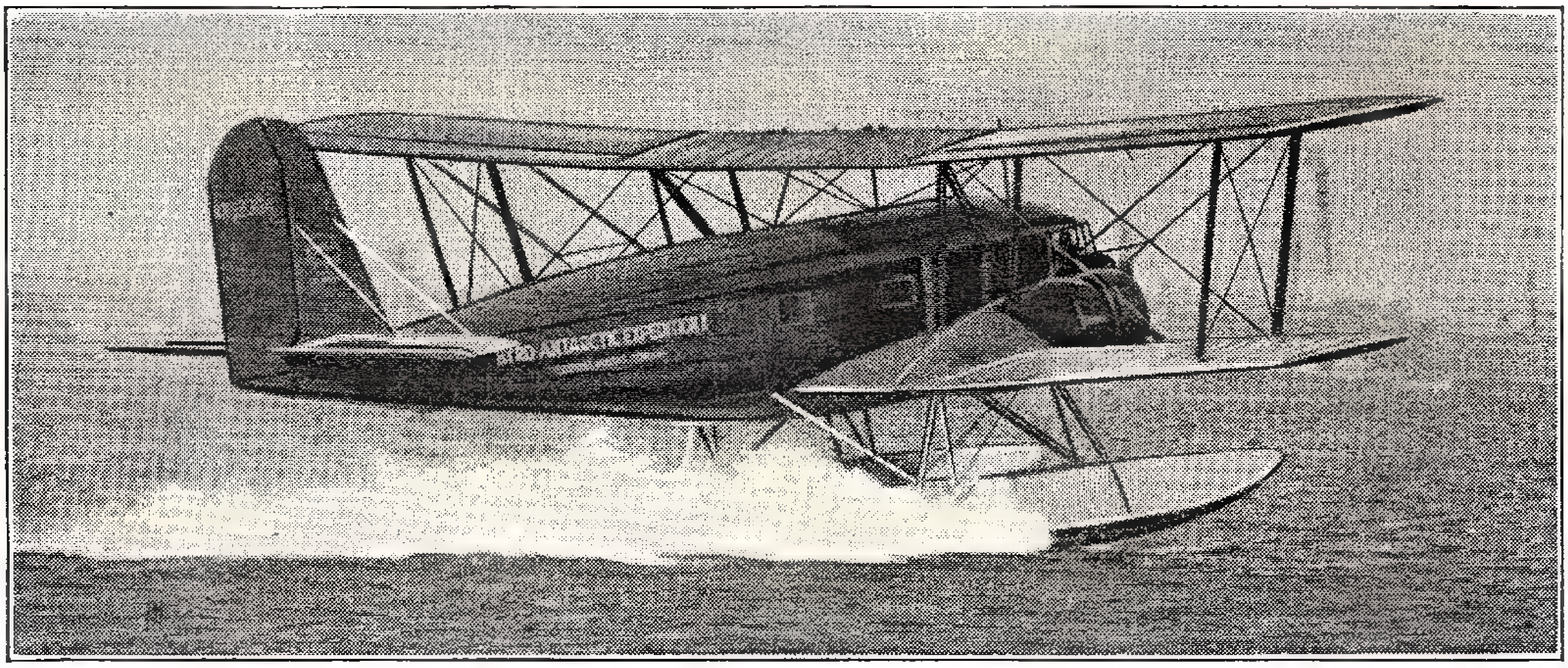
Should that Giant Curtiss Condor transport plane be forced down and Byrd and his men face death in the unexplored reaches of the great South Pole continent, radio will carry over the air every detail of the heroic rescue attempts.

Each of the sledge parties, pulled by the expedition's 150 Canadian huskies, will carry a radio transmitter and receiver when it sets out across the Ross Ice Shelf from the base at Little America on the Bay of Whales. Every one of Byrd's four other airplanes, including an autogyro, will carry radio equipment when it takes to



John Dyer, shown in the control room of station KJTY aboard the "Jacob Ruppert," will be technical engineer for the Columbia Broadcasting Company in Antarctica. This 1,000-watt transmitter will be installed at Little America to broadcast Saturday night programs of the Byrd expedition through Buenos Aires to WABC in New York.

Radio Fans Will Hear Largest Seaplane Roaring Over the South Pole



With a wing span of 82 feet and powered with two 700 horsepower engines, the Curtiss Wright Condor, shown above, will carry Admiral Byrd over the South Pole. Columbia's chain will pick up running broadcast during the flight.

the air, whether for rescue or exploration.

Admiral Byrd's second expedition to the South Pole, in addition to its great program of scientific research and exploration, will attempt one of the most ambitious radio projects ever conceived. From this frozen continent, as large as the United States and Mexico, Admiral Byrd will record the march of stirring events on a regular weekly program every Saturday night over the entire network of the Columbia Broadcasting system.

To accomplish this he is bringing to the land where latitude ends 5,000 pounds of radio equipment, including five miles of wire, 300 vacuum tubes, and dozens of microphones and power generators.

And with him, too, are budding radio stars—members of his crew. There is Alphonse Carbone of Boston, the cook, who will entertain Broadway, Hollywood, and the rest of the world with his melodies on the harmonica.

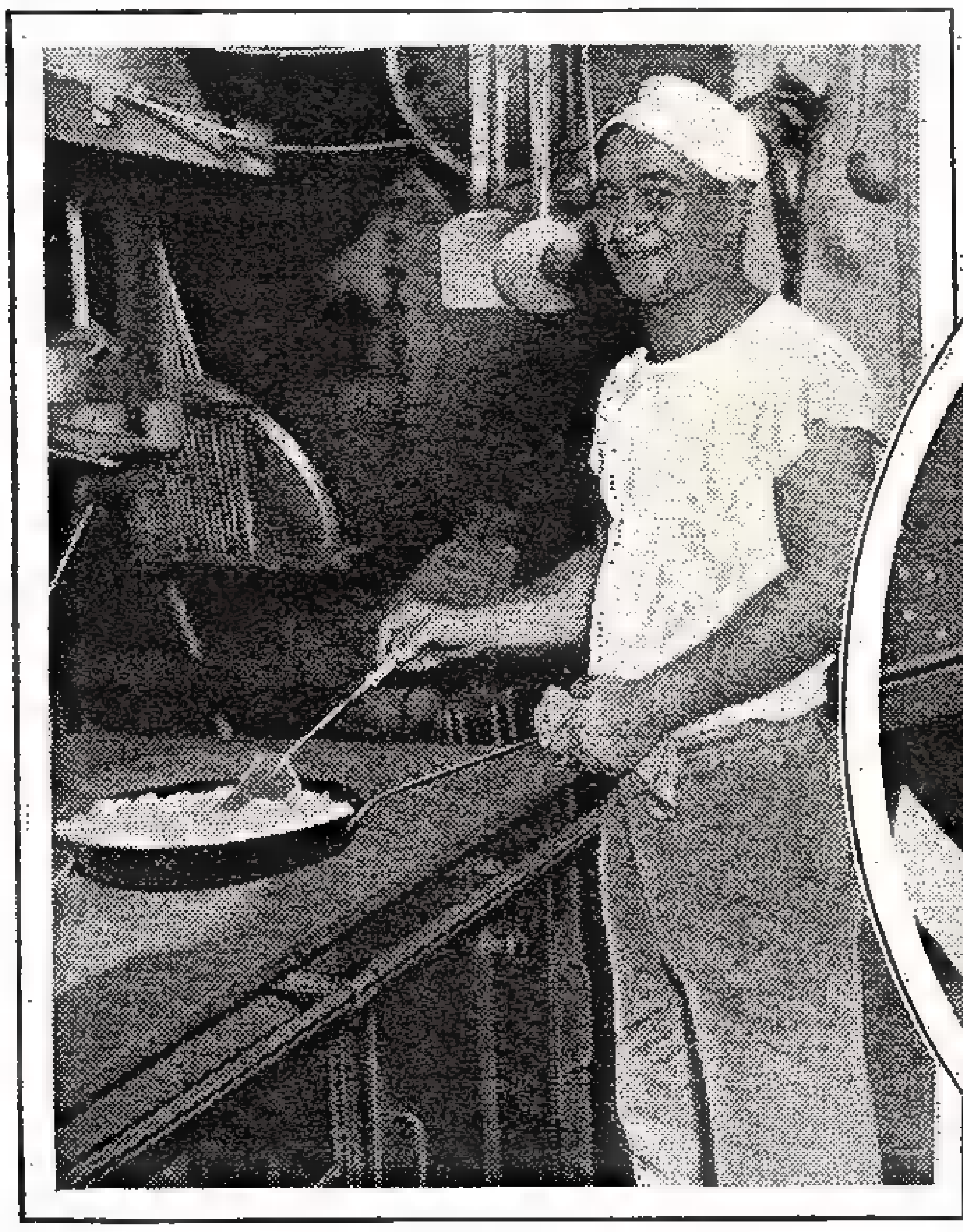
Others of the crew will strum guitars and ukeleles, while the sled dogs will add their barks to the broadcast entertainment.

Arthur Abele, Jr., 22-year-old Harvard graduate, will join in the broadcasts when he communicates with the tens of thousands of members of his "Little America Explorers' and Aviation Club." After inducing Admiral Byrd to take him to the land where latitude ends, Abele invited everyone of high school age or over to

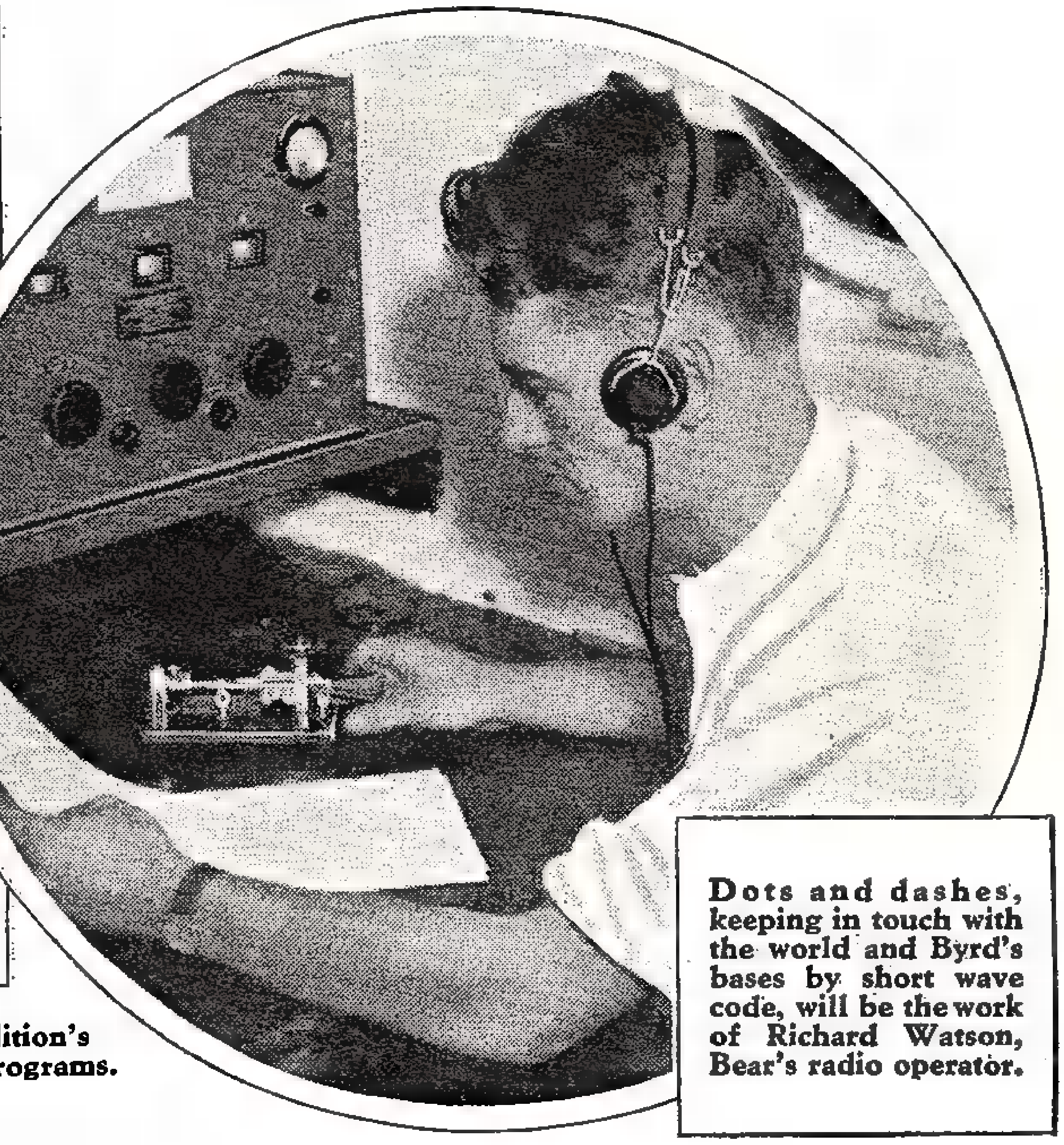
Here are the South Pole's radio stars. Huskies will bark over the air. Capt., Innes Taylor, dog master (at right), will describe his adventures with the Northwest Mounted Police.

Charles J. V. Murphy (above) will arrange the Saturday programs for Columbia from Byrd's Antarctica stations.

Crew and Sledge Dogs Will Feature All Broadcasts From Little America



A budding radio star is Alphonse Carbone, expedition's cook. He will play the harmonica on South Pole programs.



Dots and dashes, keeping in touch with the world and Byrd's bases by short wave code, will be the work of Richard Watson, Bear's radio operator.

join his organization and follow the expedition's progress from the radio broadcasts on special maps and charts.

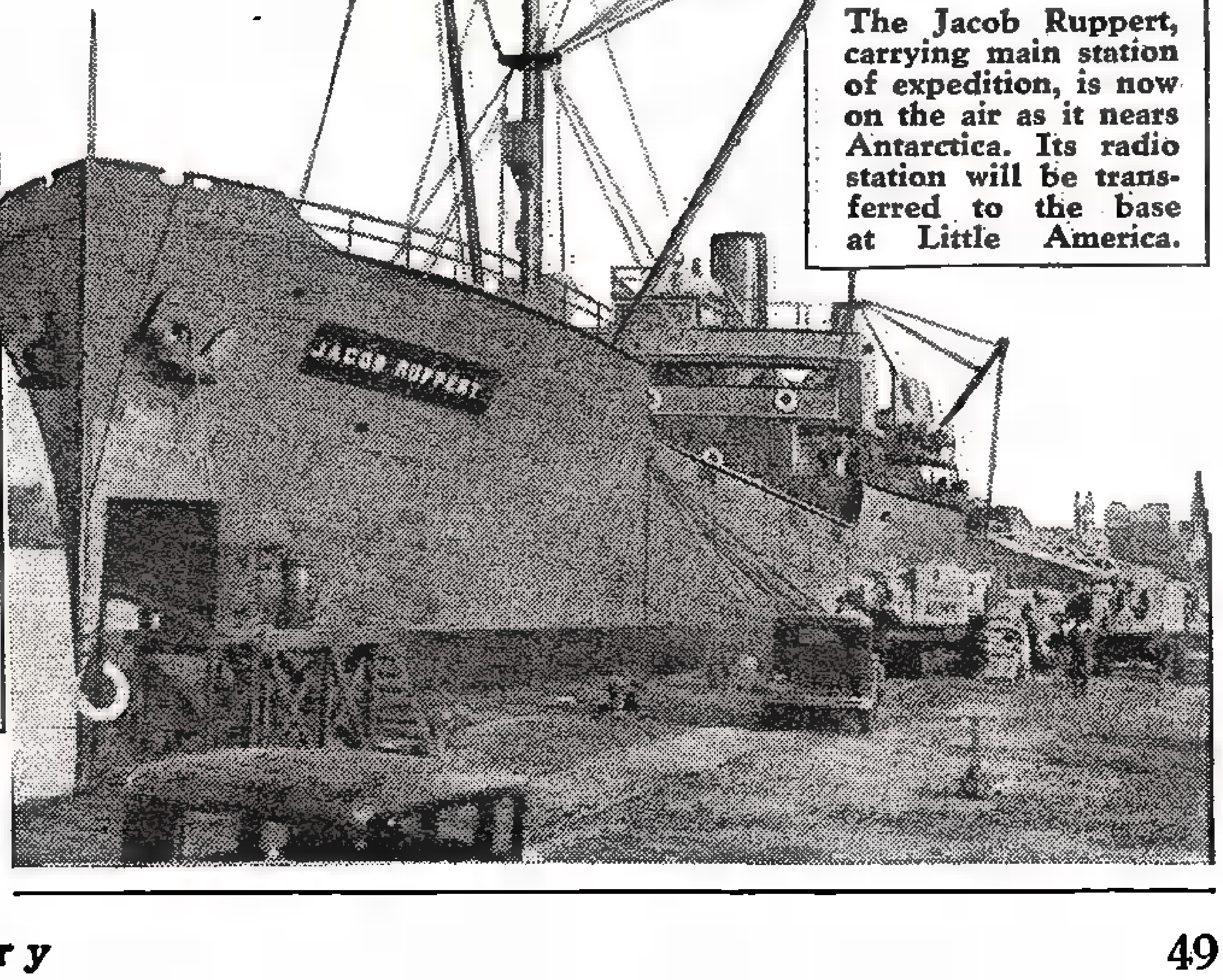
Incidentally, during his two years' stay at the South Pole Abele, who has never flown a ship, will take a complete course in aviation from Admiral Byrd and chief pilot Harold June. He will receive his ground work and actual training in the air in the 75 degree below zero climate of Antarctica.

Another of the South Pole radio stars will be Captain Innes Taylor, head dog driver and former member of the Northwest Royal Mounted Police, who will compare his adventures in the wilds of the Yukon to the ice fields of the polar regions.

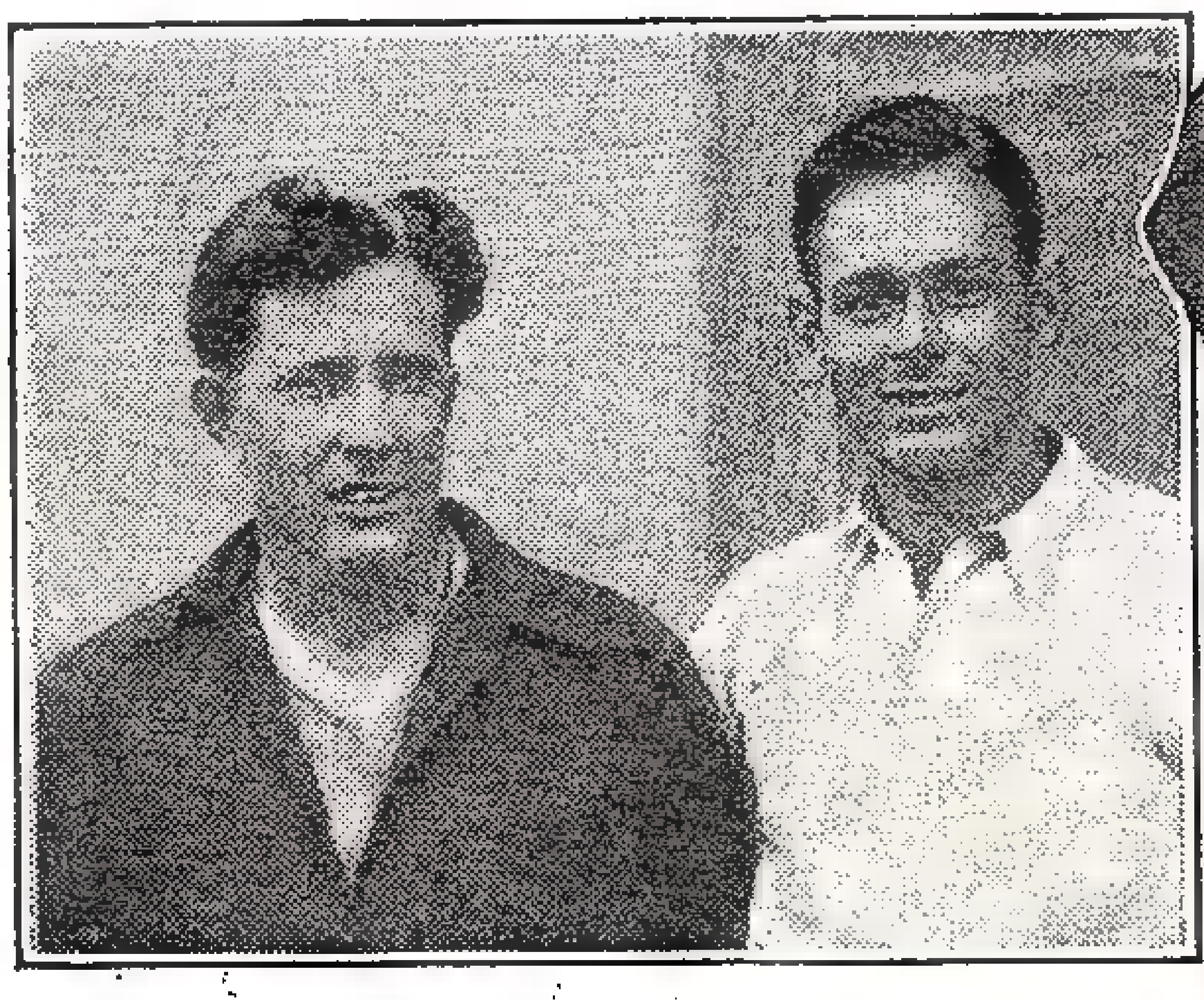
Three regular transmitters will be on the air. Aboard Byrd's steamship, the Jacob Ruppert, is a 1,000 watt short wave transmitter that will be the main broadcasting station of the expedition. It will be installed at Little America, 800 miles from the South Pole.

A second transmitter, 200 watt, will be set up at the sub-base of the expedition at the foot of Queen Maude Range, 300 miles nearer the Pole than Little America.

(Continued on page 129)



The Jacob Ruppert, carrying main station of expedition, is now on the air as it nears Antarctica. Its radio station will be transferred to the base at Little America.



Clay Bailey (left), is chief radio man and Guy Hutcheson short wave operator for Admiral Byrd's expedition to Antarctica.

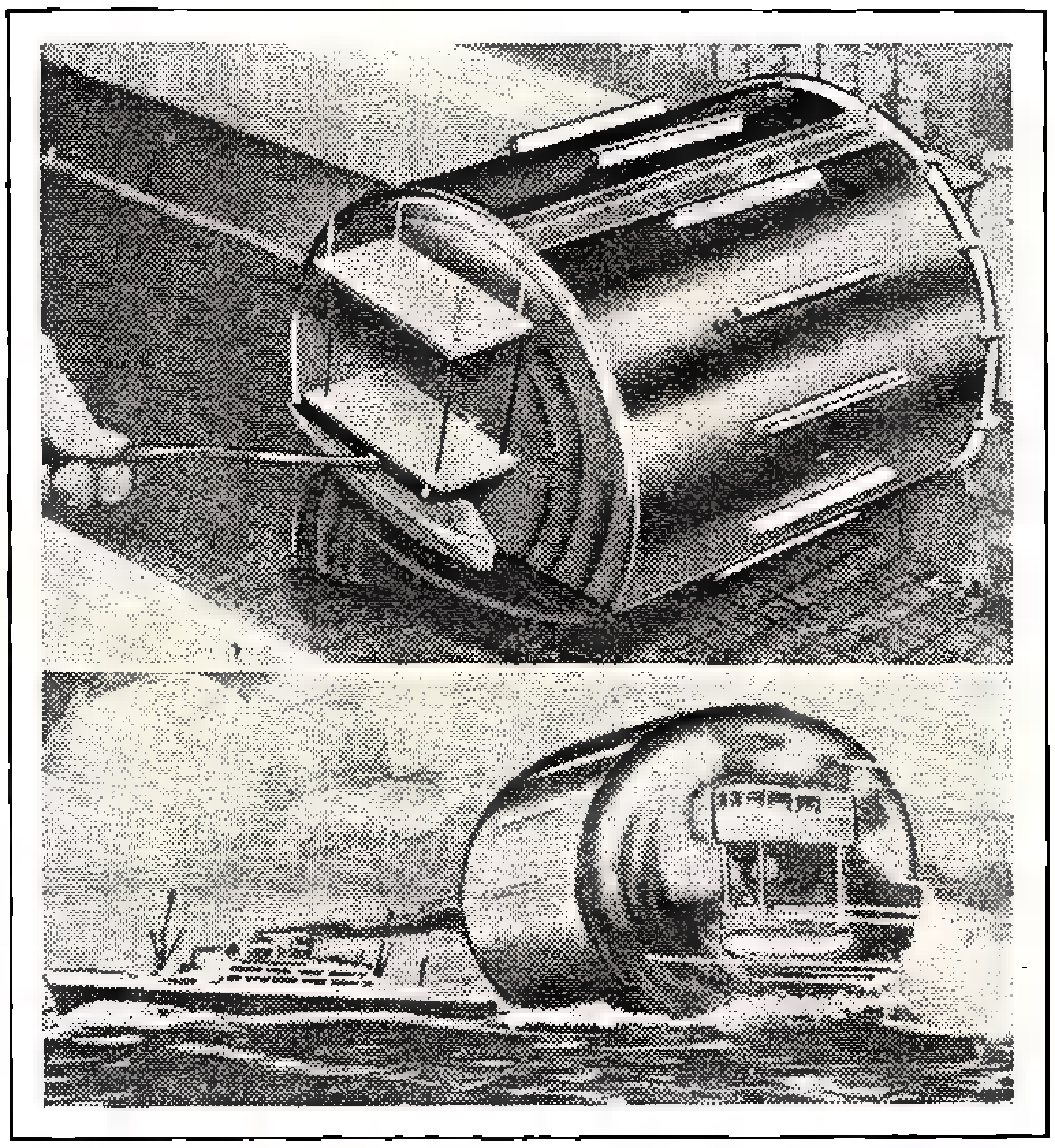
"Barrel Ship" Skips Over Ocean Surface at 100 M. P. H.

A WORKING model of a revolutionary type of rotary ocean vessel, known as the "Barrel Ship," was recently demonstrated in Seattle by its inventor, Captain Harry Barlow.

The machine consists of two cylinders, the inner of which is stationary, and contains space for cargo, passengers and propelling machinery. The outer cylindrical shell is fitted with paddles, and revolves to push the queer ship over the waves.

The interior decks are hung from the central axis, and heavily weighted to prevent any pendulum-like swinging. At the outer ends of the cylinder are cabins containing control machinery and promenade space for passengers.

The inventor asserts that a full size ship will travel at a speed of 100 miles an hour, going over the surface of the ocean with a sort of skipping motion.



Above: Working model of "Barrel Ship," showing fins which revolve with outer cylinder, and decks at end. Below is artist's conception of ship speeding over water surface.

Radio Detector Finds Old Cannon

A RADIO treasure finder was used to locate long buried Revolutionary War relics on Red Bank Battlefield, just across the Delaware river from the Philadelphia Navy Yard.

An eight-foot cast iron cannon and two ancient rifles were found just four feet from the Fort Mercer monument.

Changes in the tone of an oscillator in the radio equipment enabled searchers to locate the exact positions of cannonballs and other pieces of buried metal.

The search will be continued until the entire battlefield has been covered. The Red Bank Battle was fought at this spot October 27, 1777, between 400 Colonials and 2000 British Hessians. Fort Mercer was blown up at the approach of Lord Cornwallis' forces, and relics have previously been very difficult to locate.

Bears Dragged in With Pole Sled

IN THE wilds of the Wyoming Rockies, grizzly bears are still making life miserable for cattle.

Western cowpunchers have adopted the Indian method of bringing home the "bacon," in which long pine poles are fastened to the stirrups of their cowhorse, and the dead bear tied on to cross-pieces.

In one instance a grizzly killed a 1200 pound bull. After eating his fill and taking a nap, he dragged the carcass to a large windfall 150 yards away and partly covered it with heavy tree limbs.

Photos Courtesy Sports Afield.

Above pole sledge for dragging big game home with a horse can be rigged up in a few minutes. Western horses will not allow even dead bears to be brought near them, and cowpunchers distinctly do not like to tote heavy bears or deer on their backs. At right a young grizzly reverses usual custom and "trees" a bear-hunting cowpuncher. In national parks bears are quite tame and friendly, but not out West!

Business Advances With New Inventions

Ideas are the lifeblood of business. Here are new ideas, new inventions which you may employ profitably at your work.

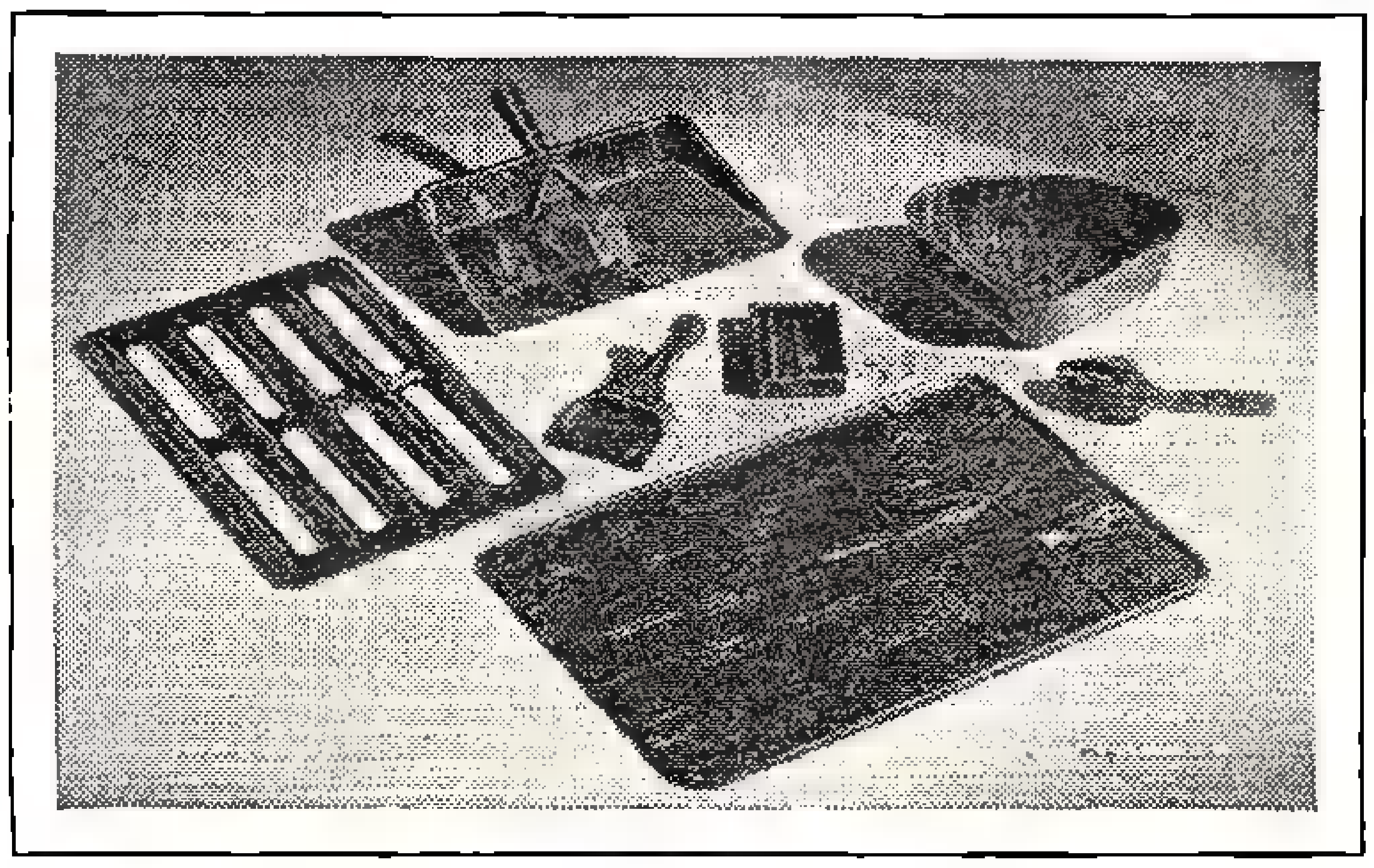
An electric regulator controls the drafts of any furnace and keeps the temperature of a home constant.

Marking air mail letters with red and blue rubber roller stamp immediately calls attention of the recipient to the importance of the letter, even though he has not seen the air mail envelope.

Magnet on new can opener catches tin shavings that ordinarily fall into the can. The revolving opener also turns down the sharp protruding edges.

Automatic carburetor control is being manufactured which provides the proper air mixture under all weather conditions. The thermostat moves a fraction of a thousandth part of an inch for each one-half degree change in temperature.

Rubber sponge attached directly to a garden hose makes car washing an easy task.



These rubber kitchen utensils have the advantage of being unbreakable. They are also practically noiseless.

Rubber ice trays simplify the problem of removing ice cubes. Just bend the tray and the cubes fall out.

Latest electric refrigerator automatically turns on refrigerator after defrosting is completed.

An air cooled cushion for the office or auto is made of sponge rubber with ventilating air ducts.

All tarnish is thoroughly removed from silverware dipped in warm water in which secret formula tablets have been dissolved. Chemical reaction does the cleaning.

A pulverizer for the office washroom makes soap powder from ordinary bar of soap by simply turning a crank when soap is needed.

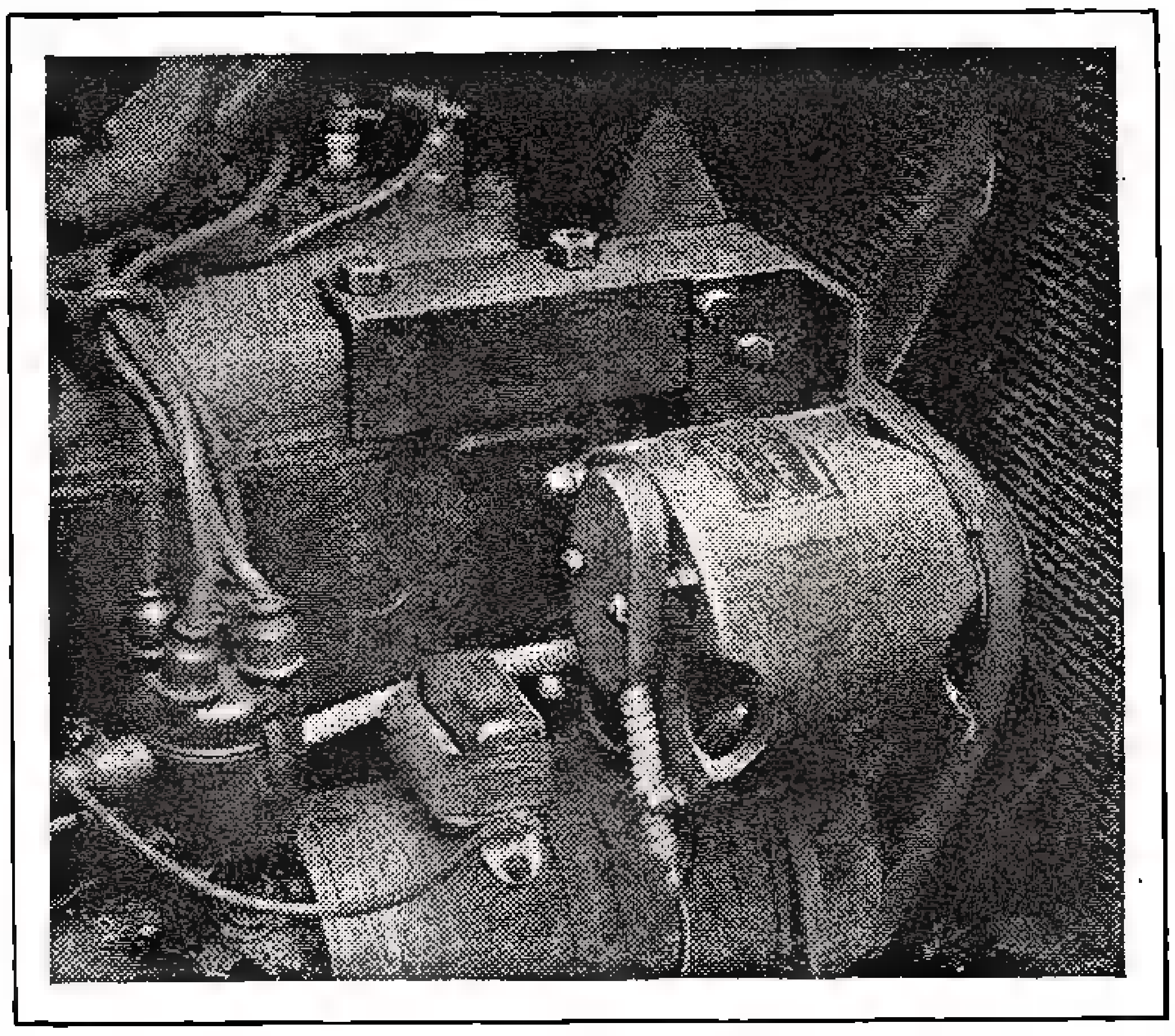
Here is the latest in midget radios, no larger than the glass at right and small enough to fit in a coat pocket.

A cocktail shaker top that fits any drinking glass can be carried in the pocket. A slight turn and it adheres to the glass.

A new air electric heater circulates warm air in all directions without a fan. It is 15 inches high and 8 inches in diameter.

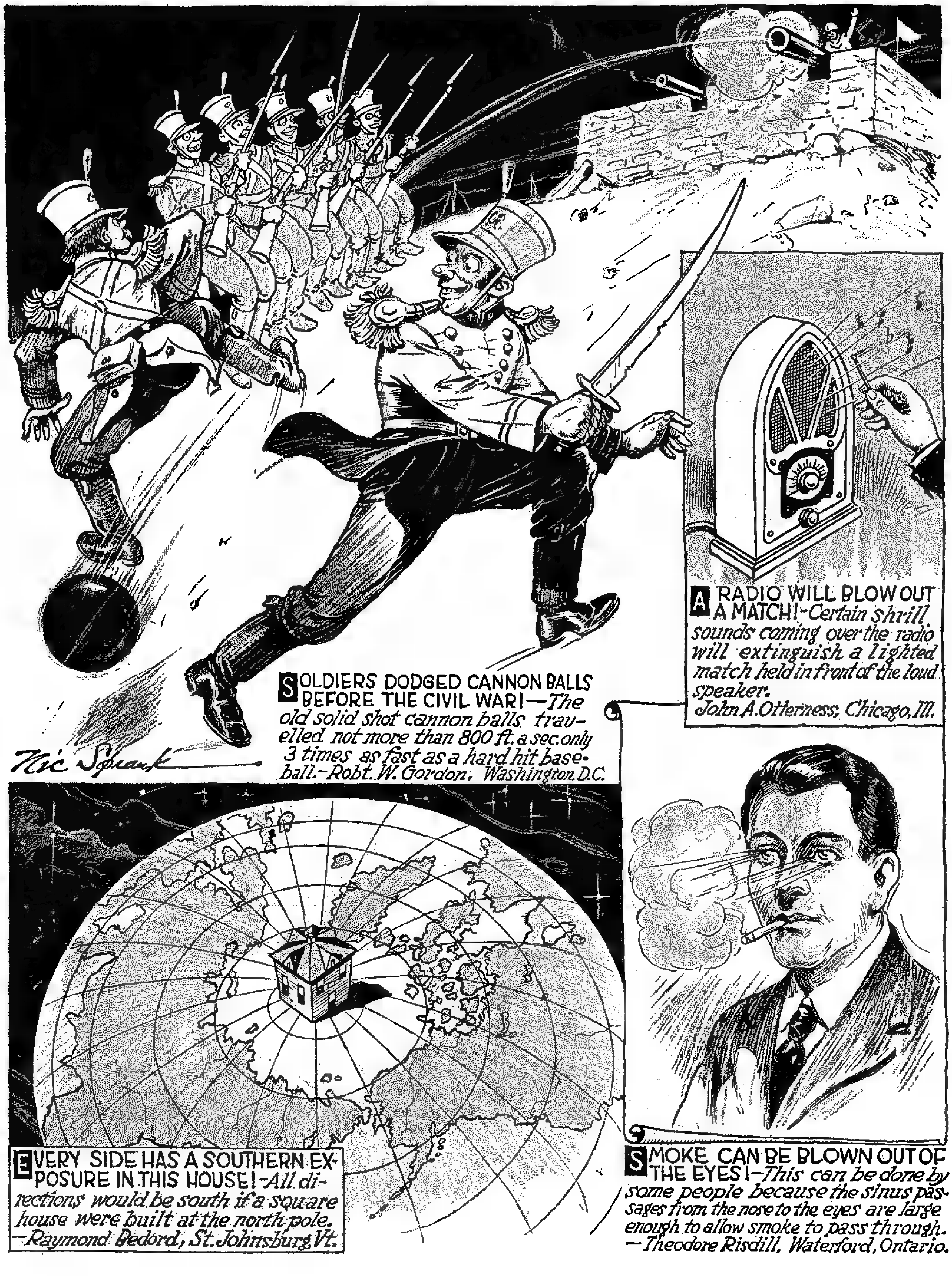
More ice cubes can be had with series of shelves that fit into refrigerator. Each shelf holds two trays. Device connects with freezing unit.

Editor's Note—Information on any of these items can be obtained by writing Modern Mechanix and Inventions. *Manufacturers are invited to submit material for this page.*



This auto generator produces 110 volts A. C. to run the home radio, neon signs, house trailer, powerful spotlight.

Something New under the Sun



SOLDIERS DODGED CANNON BALLS BEFORE THE CIVIL WAR!—*The old solid shot cannon balls travelled not more than 800 ft. a sec. only 3 times as fast as a hard hit baseball.*—Robt. W. Gordon, Washington D.C.

A RADIO WILL BLOW OUT A MATCH!—*Certain shrill sounds coming over the radio will extinguish a lighted match held in front of the loud speaker.*
John A. Otterness, Chicago, Ill.

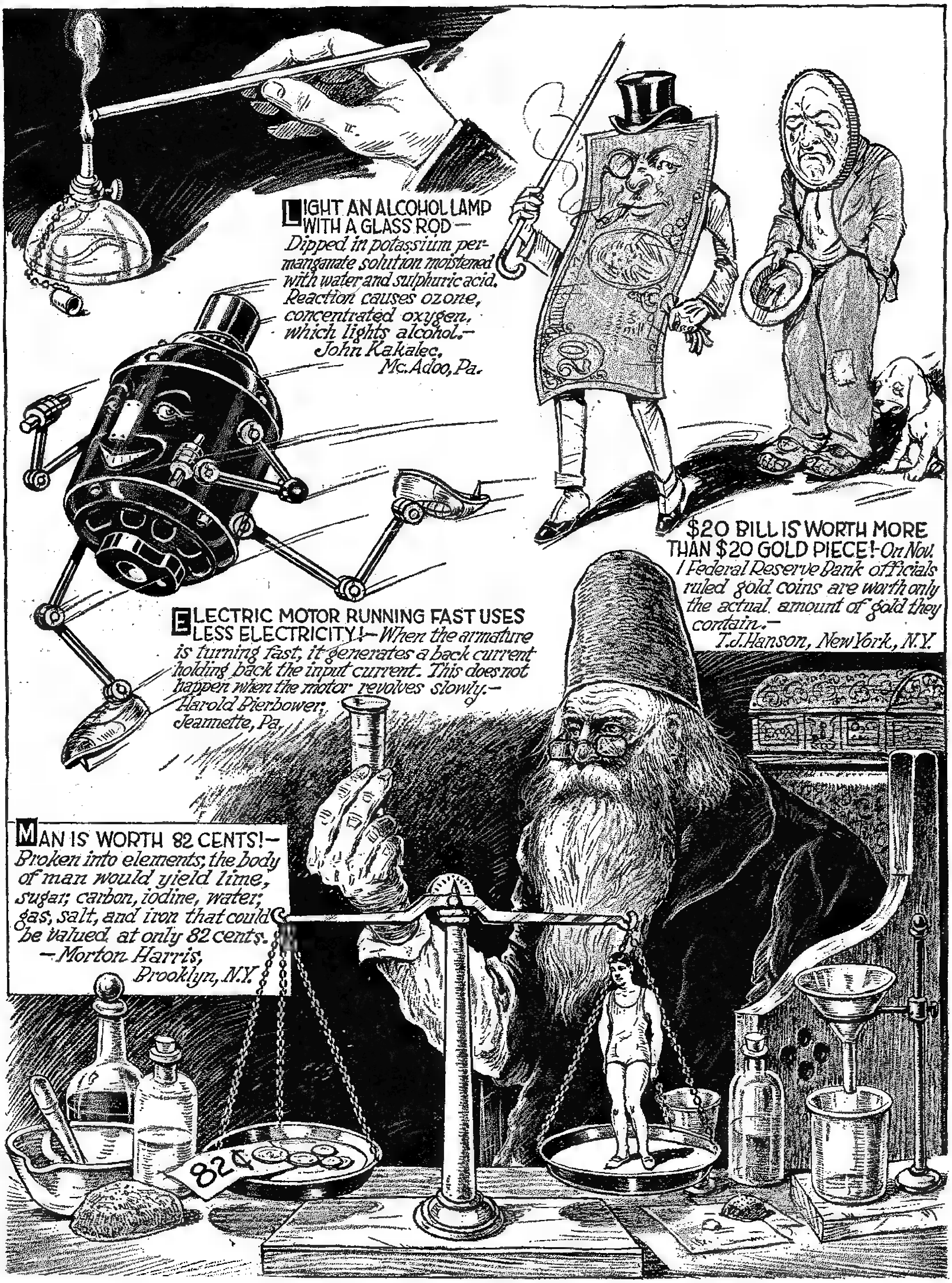
EVERY SIDE HAS A SOUTHERN EXPOSURE IN THIS HOUSE!—*All directions would be south if a square house were built at the north pole.*
—Raymond Bedord, St. Johnsburg, Vt.

SMOKE CAN BE BLOWN OUT OF THE EYES!—*This can be done by some people because the sinus passages from the nose to the eyes are large enough to allow smoke to pass through.*
—Theodore Risdill, Waterford, Ontario.

On the surface many odd facts that seem to defy natural law are easily understandable when the physical conditions back of the phenomena are known. Here are two pages illustrating facts that appear fallacious at a casual glance, but which are quite natural when all conditions surrounding them are considered. Remember Nic Sprank pays One Dollar for all scientific oddities acceptable to Modern Mechanix editors. What have you to offer for Nic Sprank's pages of oddities?

in Oddities of Science

by NIC SPRANK



LIGHT AN ALCOHOL LAMP WITH A GLASS ROD—*Dipped in potassium permanganate solution moistened with water and sulphuric acid. Reaction causes ozone, concentrated oxygen, which lights alcohol.*—*John Kakalec, Mc.Adoo, Pa.*

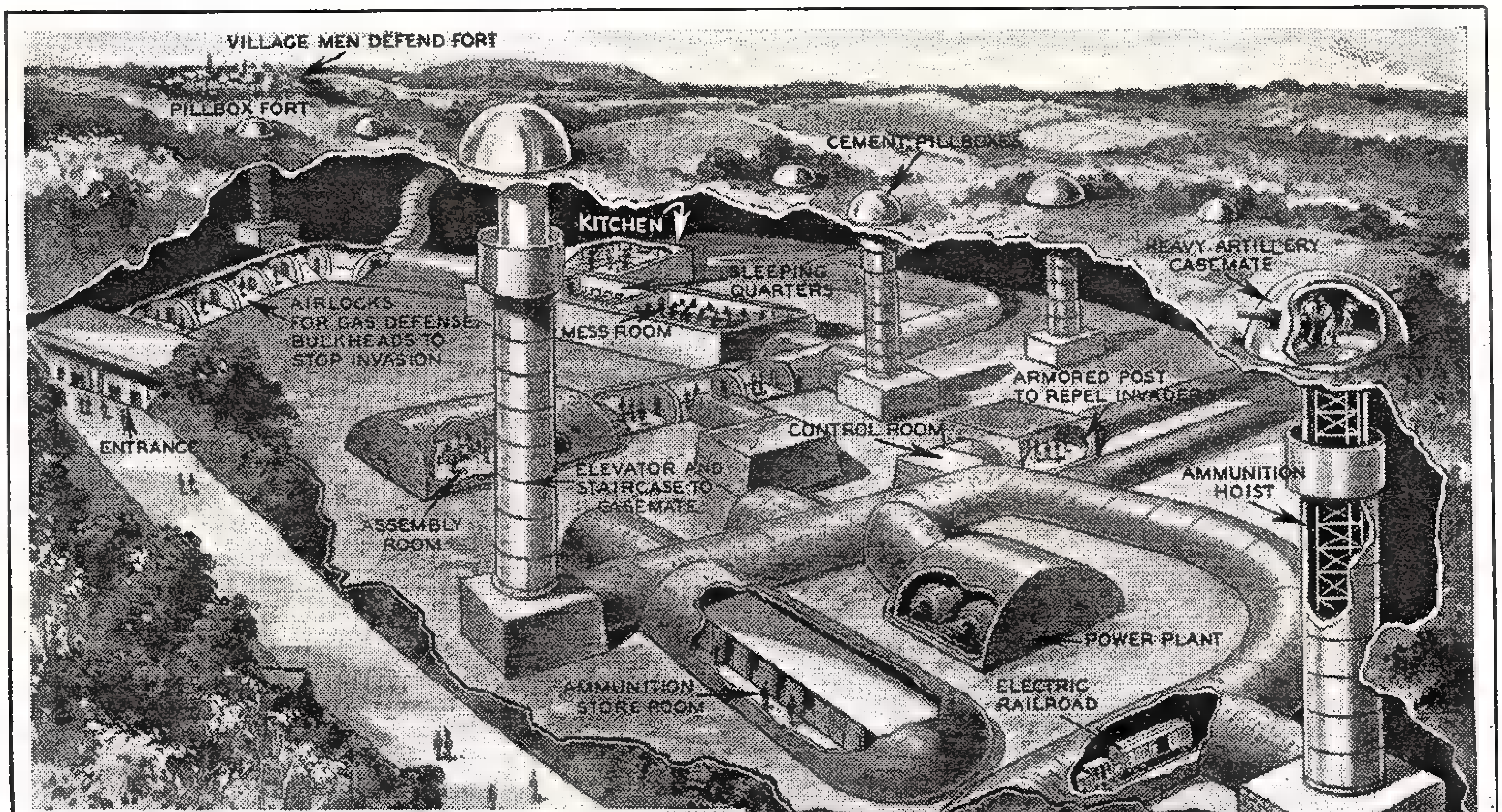
$20 BILL IS WORTH MORE THAN $20 GOLD PIECE!—*On Nov. 1 Federal Reserve Bank officials ruled gold coins are worth only the actual amount of gold they contain.*—*T. J. Hanson, New York, N.Y.*

ELECTRIC MOTOR RUNNING FAST USES LESS ELECTRICITY!—*When the armature is turning fast, it generates a back current holding back the input current. This does not happen when the motor revolves slowly.*—*Harold Pierbower, Jeannette, Pa.*

MAN IS WORTH 82 CENTS!—*Broken into elements, the body of man would yield lime, sugar, carbon, iodine, water, gas, salt, and iron that could be valued at only 82 cents.*—*Morton Harris, Brooklyn, N.Y.*

These strange facts of science may bring to mind some of the things which on every hand refute some of the accepted notions about nature. ONE DOLLAR will be paid you by Nic Sprank for every Oddity he considers good enough for these pages. Try your luck! Send in something new—don't re-hash the obvious, and your chances of getting a dollar bill are as good as the next man's. Address Nic Sprank, care Modern Mechanix, 529 South 7th Street, Minneapolis, Minn.

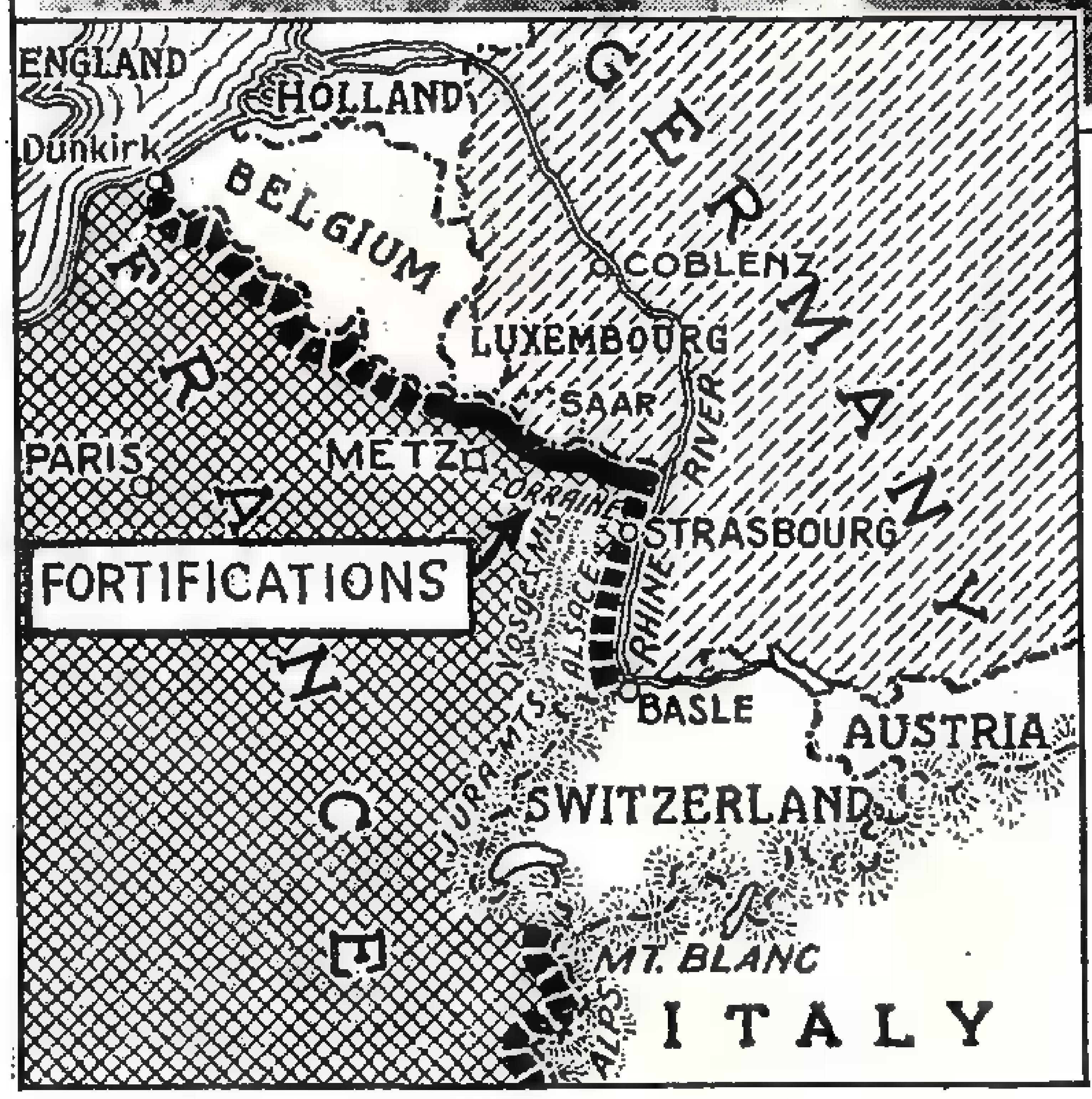
World's Greatest Underground Fortifications Guard France


VILLAGE MEN DEFEND FORT
PILLBOX FORT
CEMENT PILLBOXES
KITCHEN
SLEEPING QUARTERS
MESS ROOM
AIRLOCKS FOR GAS DEFENSE BULKHEADS TO STOP INVASION
HEAVY ARTILLERY CASEMATE
ARMORED POST TO REPEL INVADERS
CONTROL ROOM
ENTRANCE
ELEVATOR AND STAIRCASE TO CASEMATE
ASSEMBLY ROOM
AMMUNITION HOIST
POWER PLANT
AMMUNITION STORE ROOM
ELECTRIC RAILROAD

Buried deep beneath hills are the impregnable forts shown in the above drawing. Even railways are provided for.

INVISIBLE and sunk beneath the rolling and wooded terrain in Lorraine is a great underground fortification system, 200 miles long, guarding France's vital industrial area.

The forts, which cost 150 million dollars, are the greatest in the world and defy attack by gas, infantry, artillery, or air bombs. Living quarters, magazines, power stations, and control stations are out of reach of all means of attack. Bulkheads in the underground passages shut out both gas and invaders and armored posts at various points bring additional protection.


ENGLAND
HOLLAND
Dunkirk
BELGIUM
GERMANY
FRANCE
COBLENZ
LUXEMBOURG
SAAR
RHINE RIVER
PARIS
METZ
LORRAINE
STRASBOURG
FORTIFICATIONS
ALSACE
VOSGES MTS.
JURA MTS.
BASLE
AUSTRIA
SWITZERLAND
MT. BLANC
ALPS
ITALY

Solid black line shows location of 200 mile system of French underground forts, opposite disputed Saar basin.

German Rises Six Miles in Rocket

IN HISTORY'S first successful rocket flight, Otto Fischer, brother of the inventor of the rocket plane, was shot 32,000 feet into the air in a shining 24-foot steel projectile.

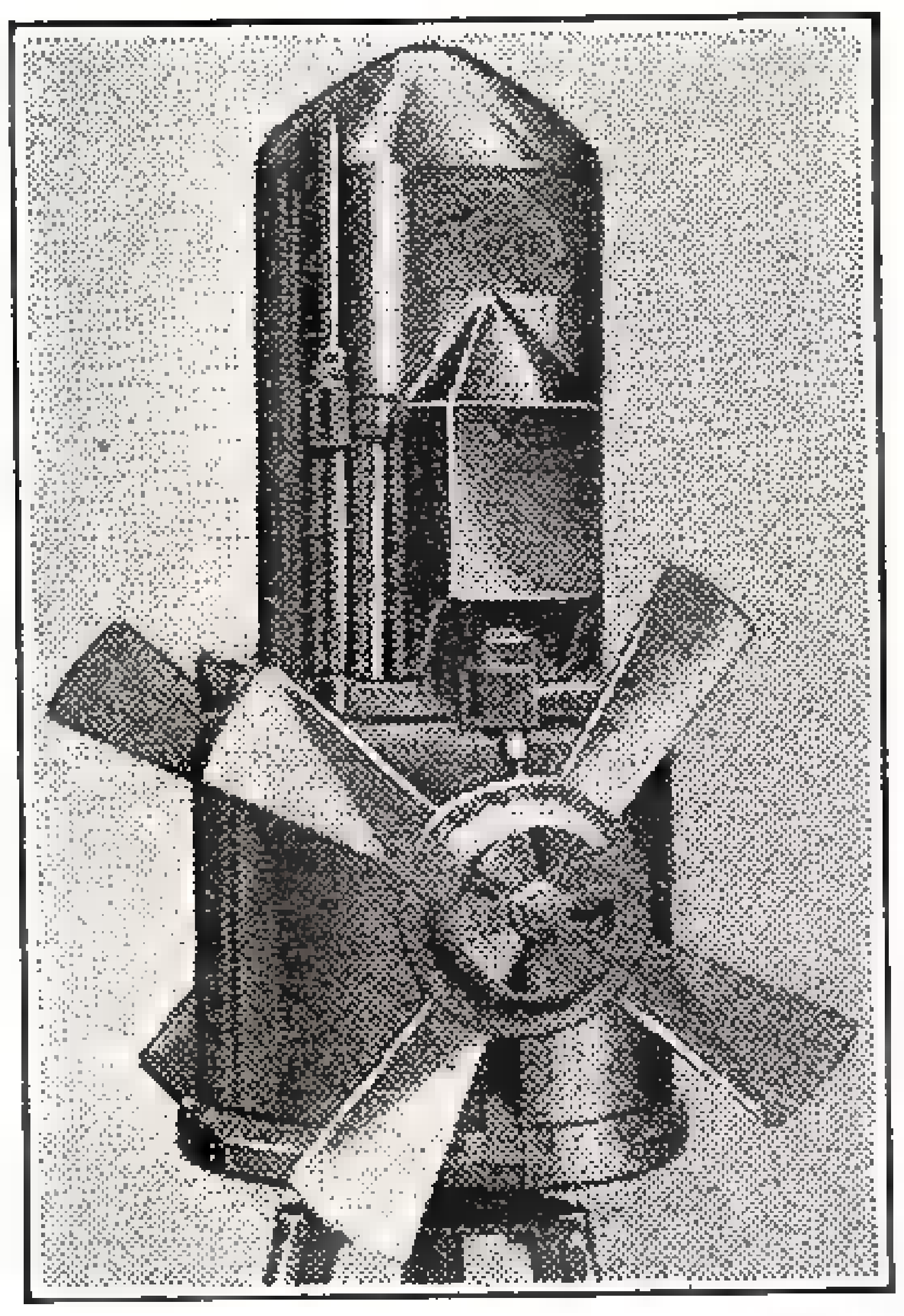
With a blinding flash the rocket ship shot out of its steel framework and disappeared into the sky. It reappeared a few minutes later, dangling from a parachute, its pilot maneuvering to land on the little island of Rugen in the Baltic Sea, where the flight started.

The pilot was quoted as saying, "I left the ground in a deafening roar and lost consciousness for a moment. When I came to my senses the altimeter was flickering at 32,000 feet. It began to drop rapidly. I pulled the parachute release ring."

Moisture Fan Bests Tropic Heat

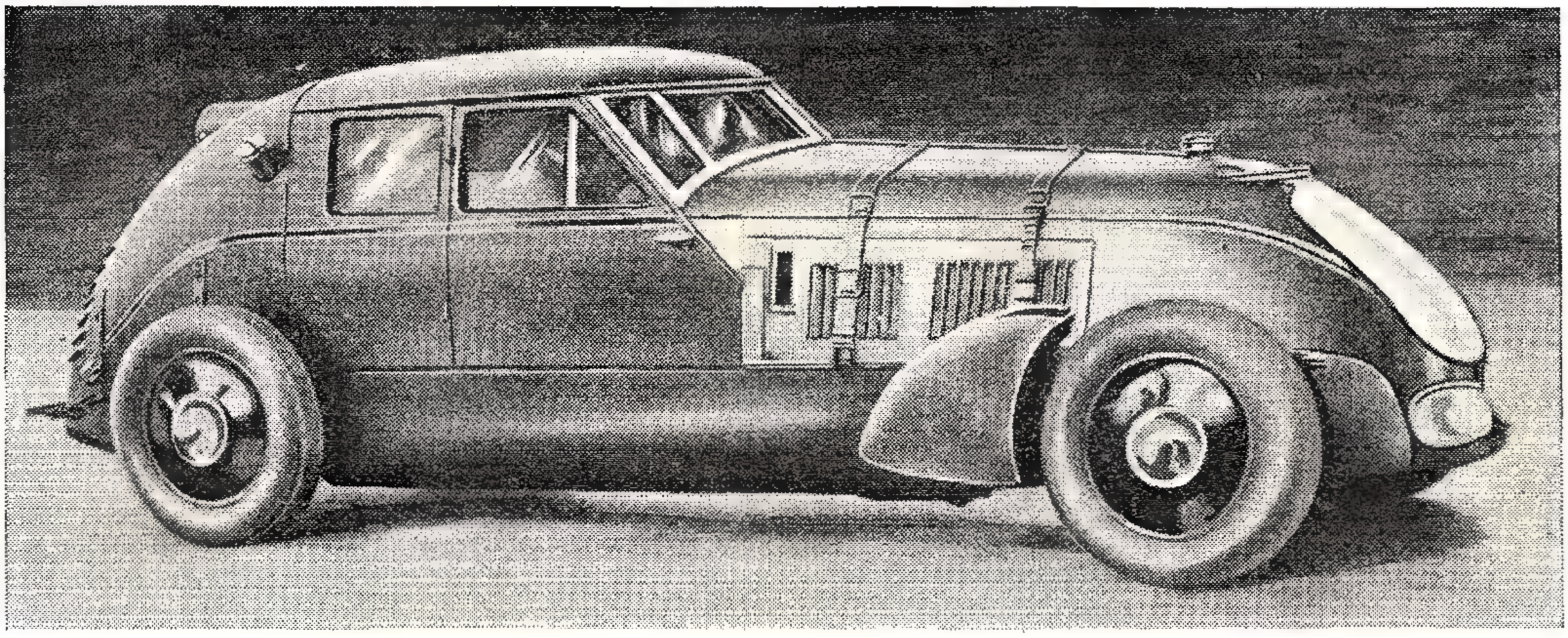
NEW air conditioning fans, tiny but wonderfully efficient, are being installed in every French government office in the tropics.

A drum filled with ice water or other liquid revolves inside the unit, throwing liquid out through short capillary tubes into blades of two fans turning at 4000 r.p.m. Large halls can be cooled and humidified in 10 min.



In this French air conditioning unit, the fan blades, driven at a speed of 4000 r.p.m., cool rooms with washed air.

Diesel Car Breaks World's Record Despite a Heavy Rain



Flashing over the famed Brooklands, England, race track at 103.25 m.p.h., Captain Eyston set a new world's speed record for Diesel-powered automobiles. The car is a comfortable salon model with enclosed, streamlined body.

A NEW world's speed record for Diesel-powered automobiles of 103.25 m.p.h. has been set by Captain G. E. T. Eyston at the Brooklands, England, race track.

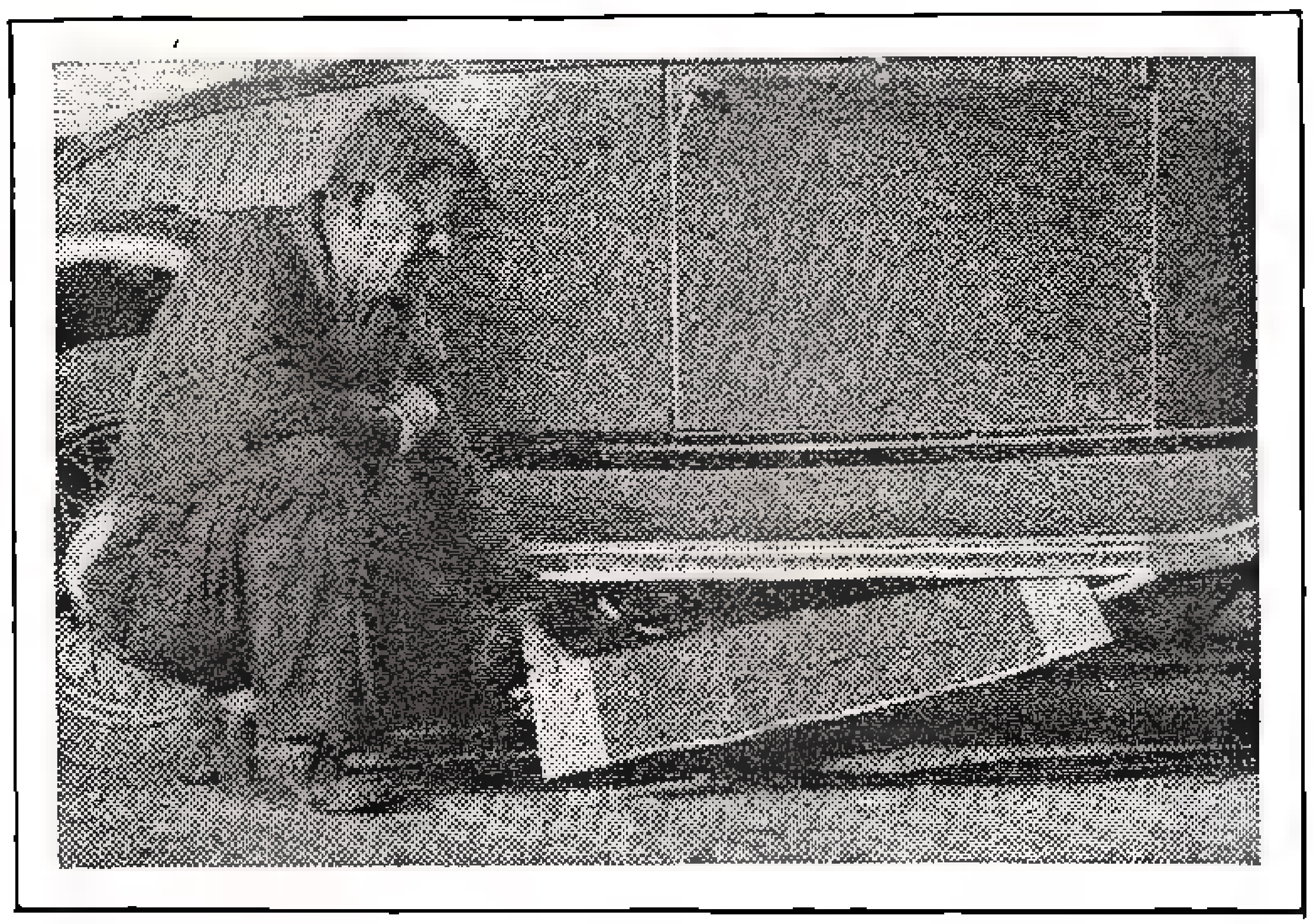
Despite heavy rain that necessitated using non-skid tires, Capt. Eyston beat the previous record of 100.75 m.p.h. created at Daytona, Florida, in 1931 by C. L. Cummins.

The six cylinder Diesel engine developing 130 h.p. and weighing only 1,414 pounds, is exactly similar to engines used in many London omnibuses.

The completely enclosed streamlined body is a radical departure in racing car design. The streamlined tail contains a tank holding sufficient fuel for 800 miles of normal driving. Fuel consumption at racing speed is only twenty miles to the gallon.

Efficient Antenna for Auto Radio

A MANUFACTURER of radio equipment has designed a novel antenna for auto radios. As shown below, the antenna is attached to the underside of the running board where it is out of the way.



Two thin strips of rubber sheeting in which fine copper wires have been vulcanized form automobile radio antenna.

New Craft Makes Veneer Effects

INTARSIA CRAFT

Intricate inlay designs can be worked out in various colored woods by anyone with "Intarsia Craft." Paper-thin sheets of wood come glued to a muslin backing and already punched in different shapes. The inlay pieces are glued to the wood being decorated, smoothed down with a hot iron, and varnished.

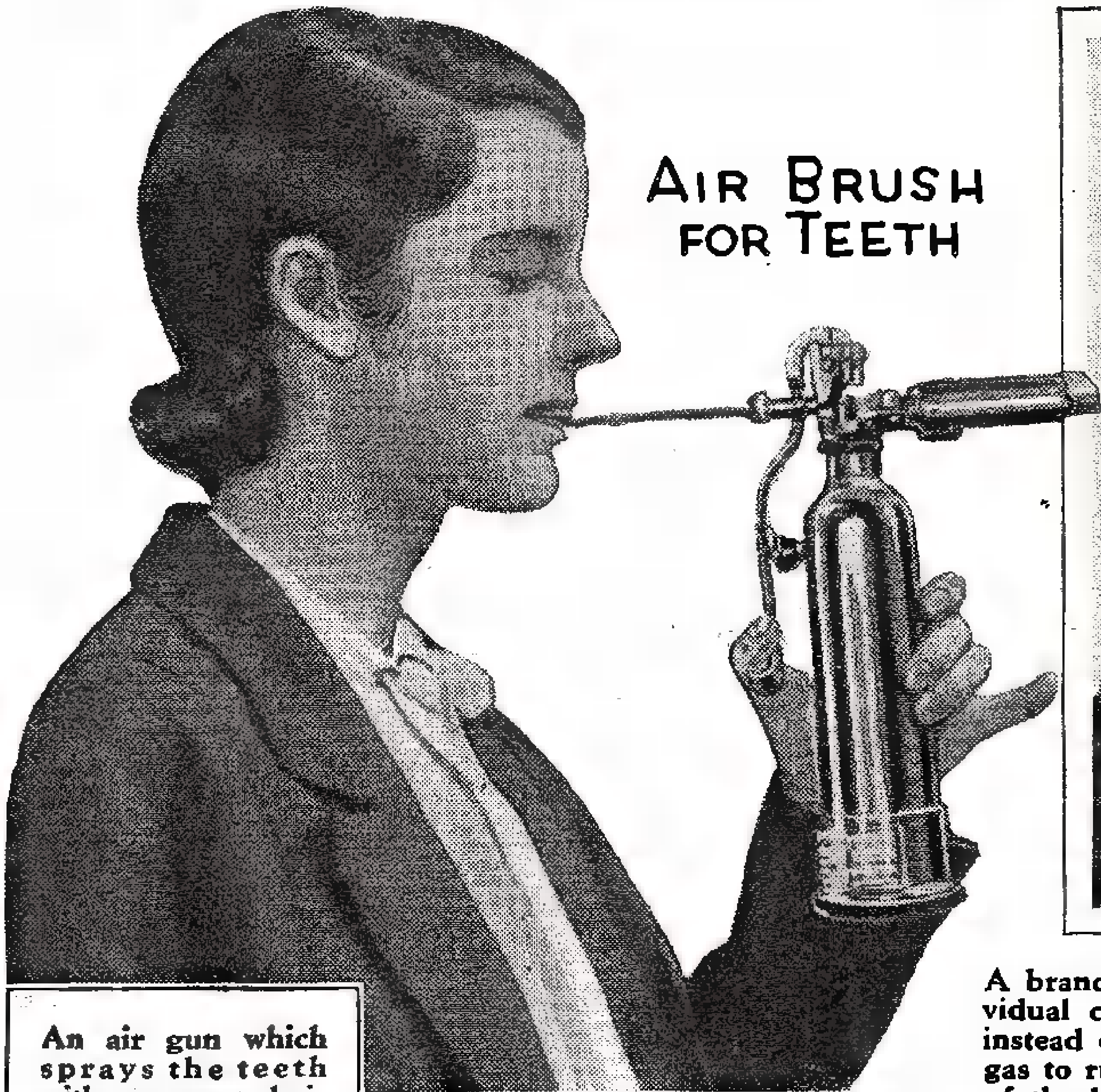
DECORATING furniture and wood novelties with beautiful natural wood inlays is no longer the sole accomplishment of the patient wood carver. Wm. A. Gillies of Milwaukee, Wisconsin, has developed a process whereby wood can be sliced into sheets 1/85th of an inch thick, and mounted on a glue-faced muslin backing.

This sheet of natural wood is so thin and pliable that it can be rolled around an ordinary lead pencil without cracking.

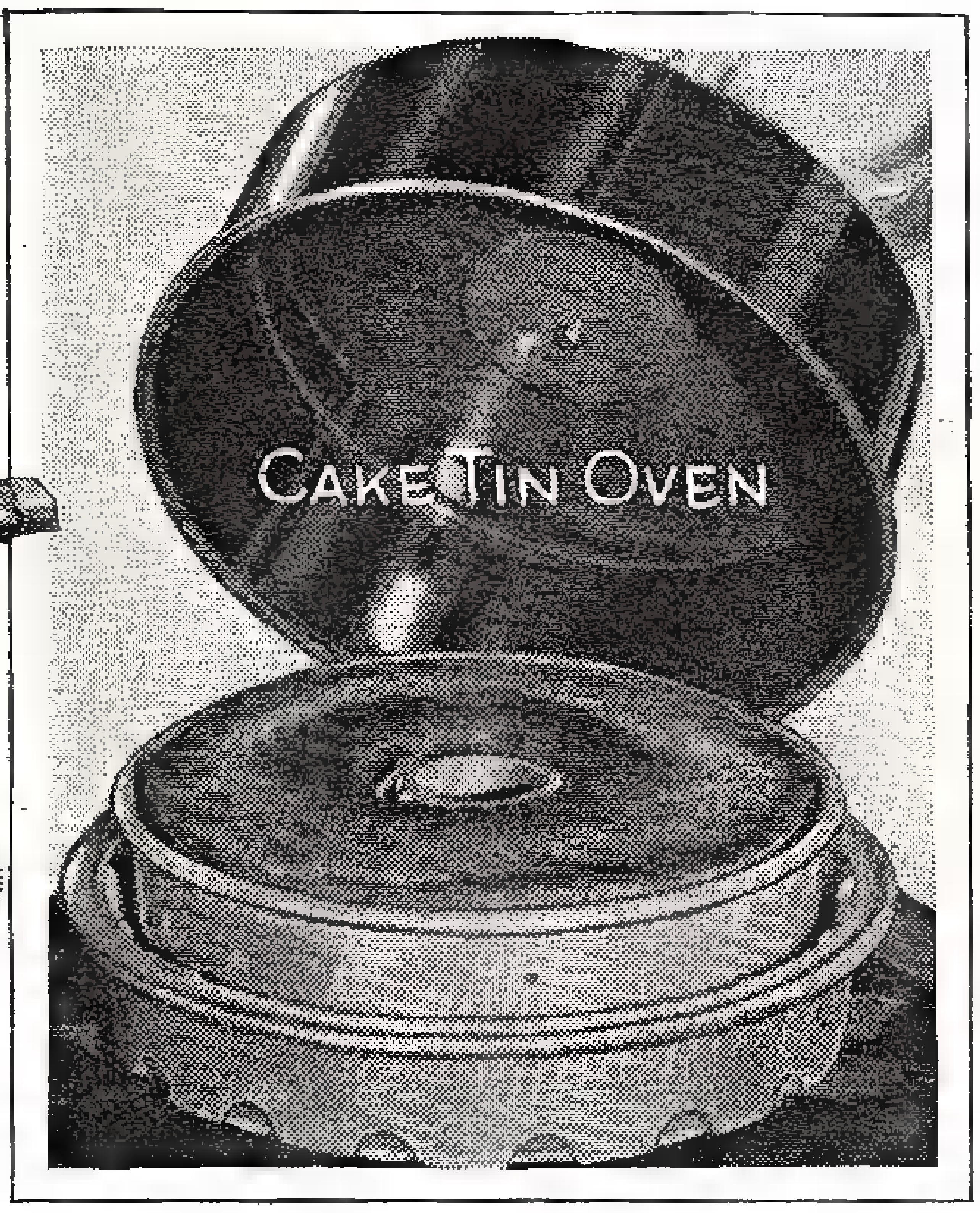
Accurate presses punch intricate designs from different varieties of wood, eliminating the tedious hand cutting and fitting of ordinary inlay work.

Stove Top Oven Among New

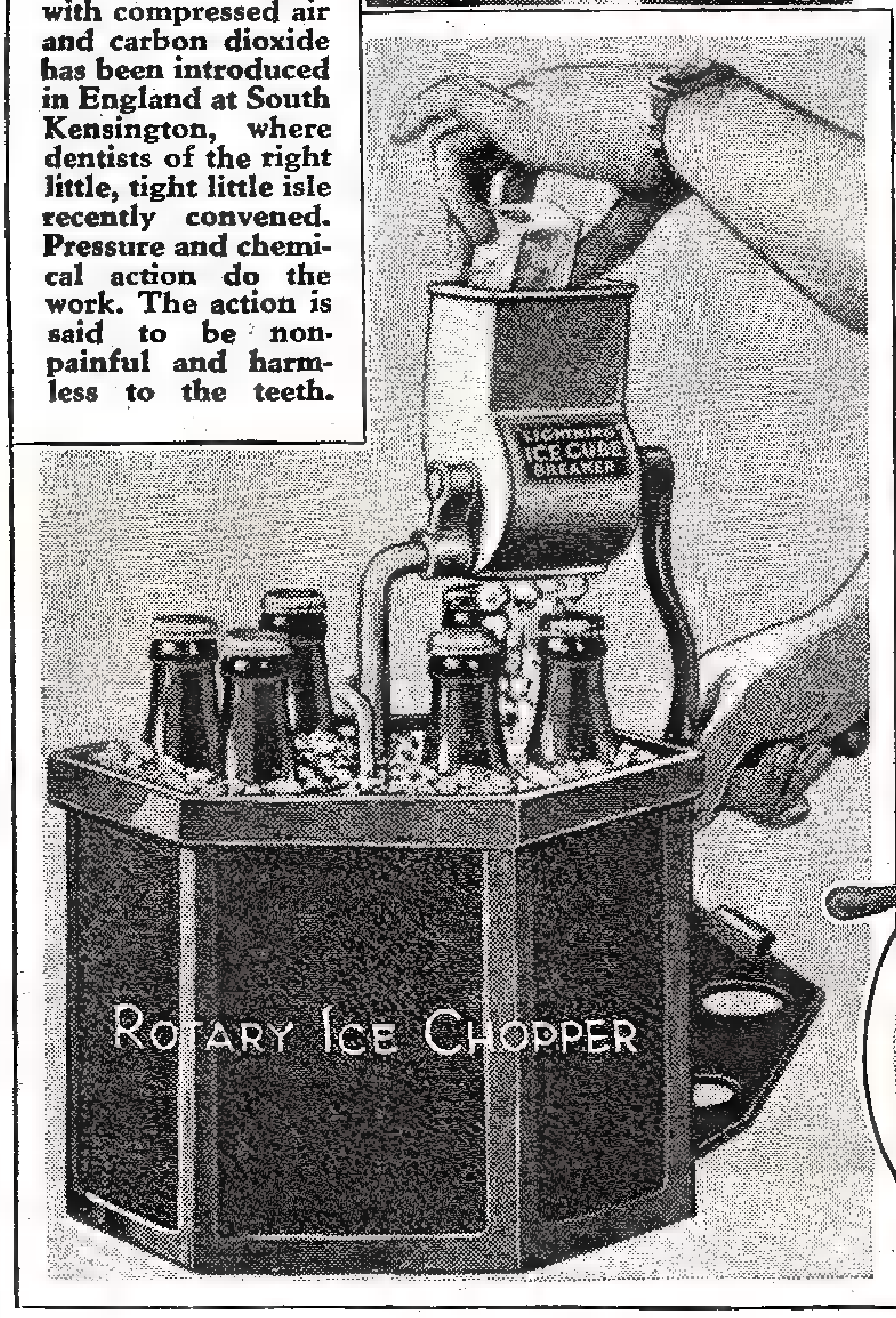
"What won't they think of next?" the surprised householder asks as a compressed air toothbrush is added to the month's discoveries.

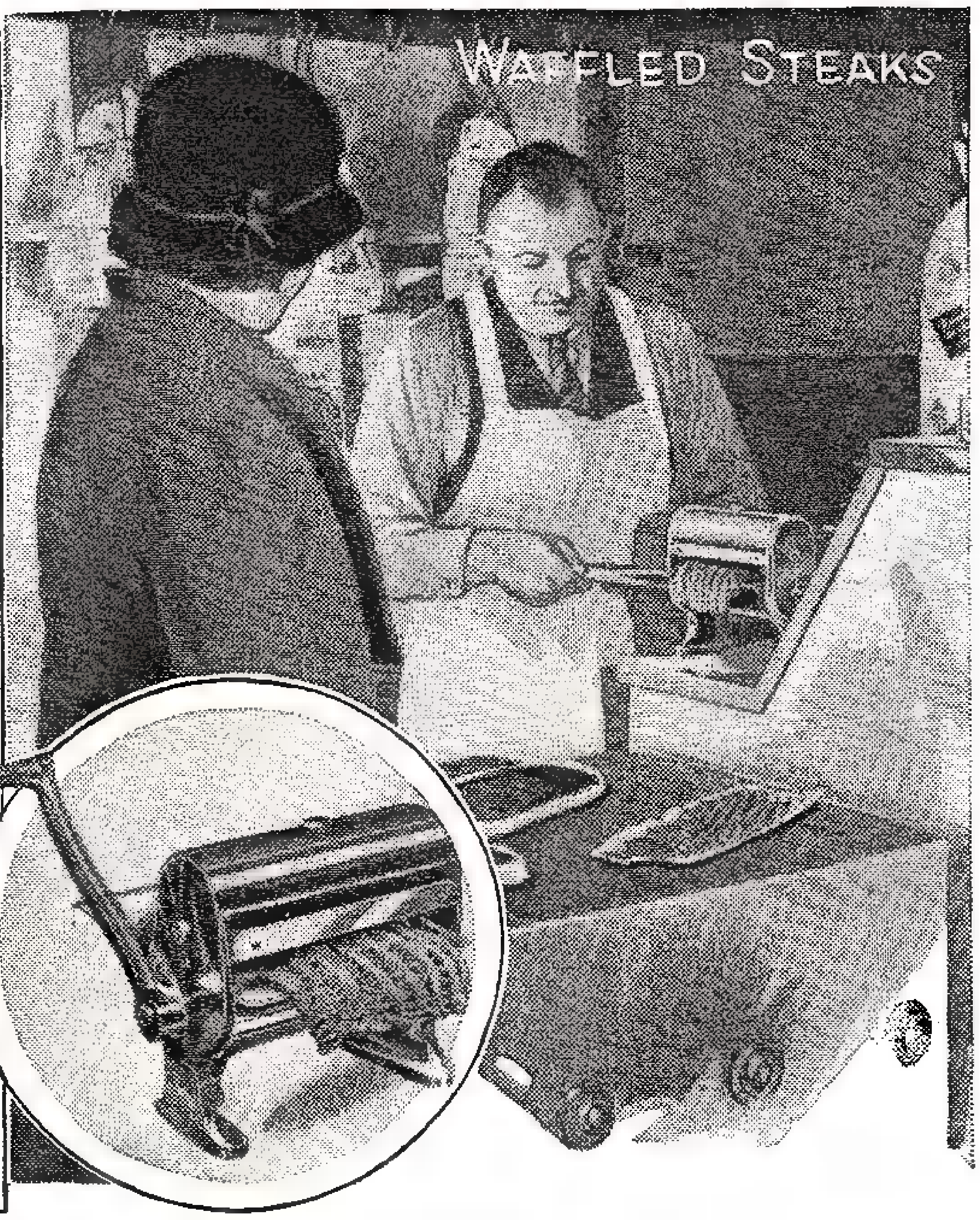


An air gun which sprays the teeth with compressed air and carbon dioxide has been introduced in England at South Kensington, where dentists of the right little, tight little isle recently convened. Pressure and chemical action do the work. The action is said to be non-painful and harmless to the teeth.



A brand new idea in ovens is one which fits the individual cake tin and can be used on top of the stove instead of in the regular big oven which takes a lot of gas to run. It has a funnel shaped opening in the base of the bake pot which gives even distribution of heat. Being sealed it preserves the moisture of the object which is baking and therefore does a better bake job.

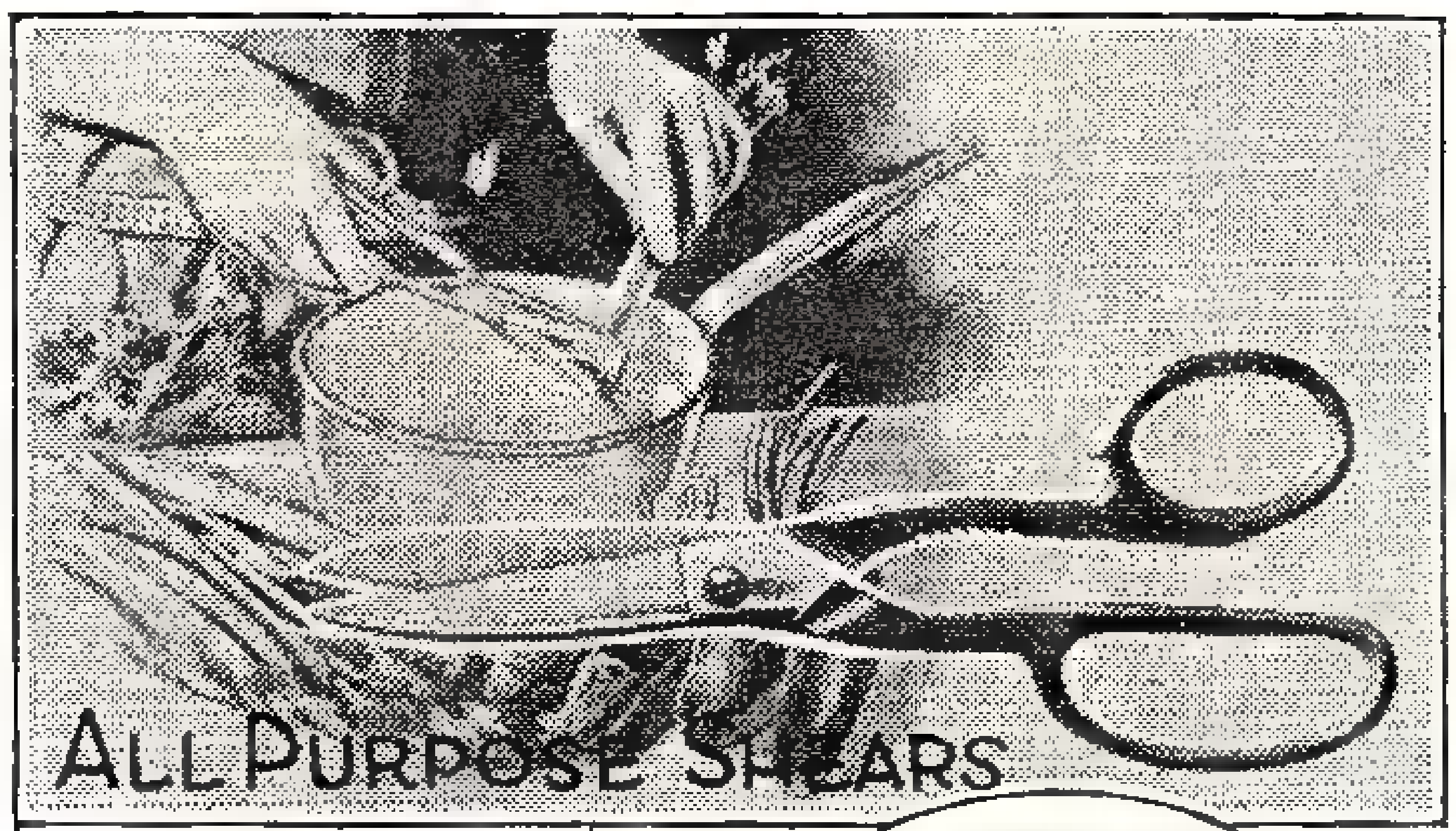




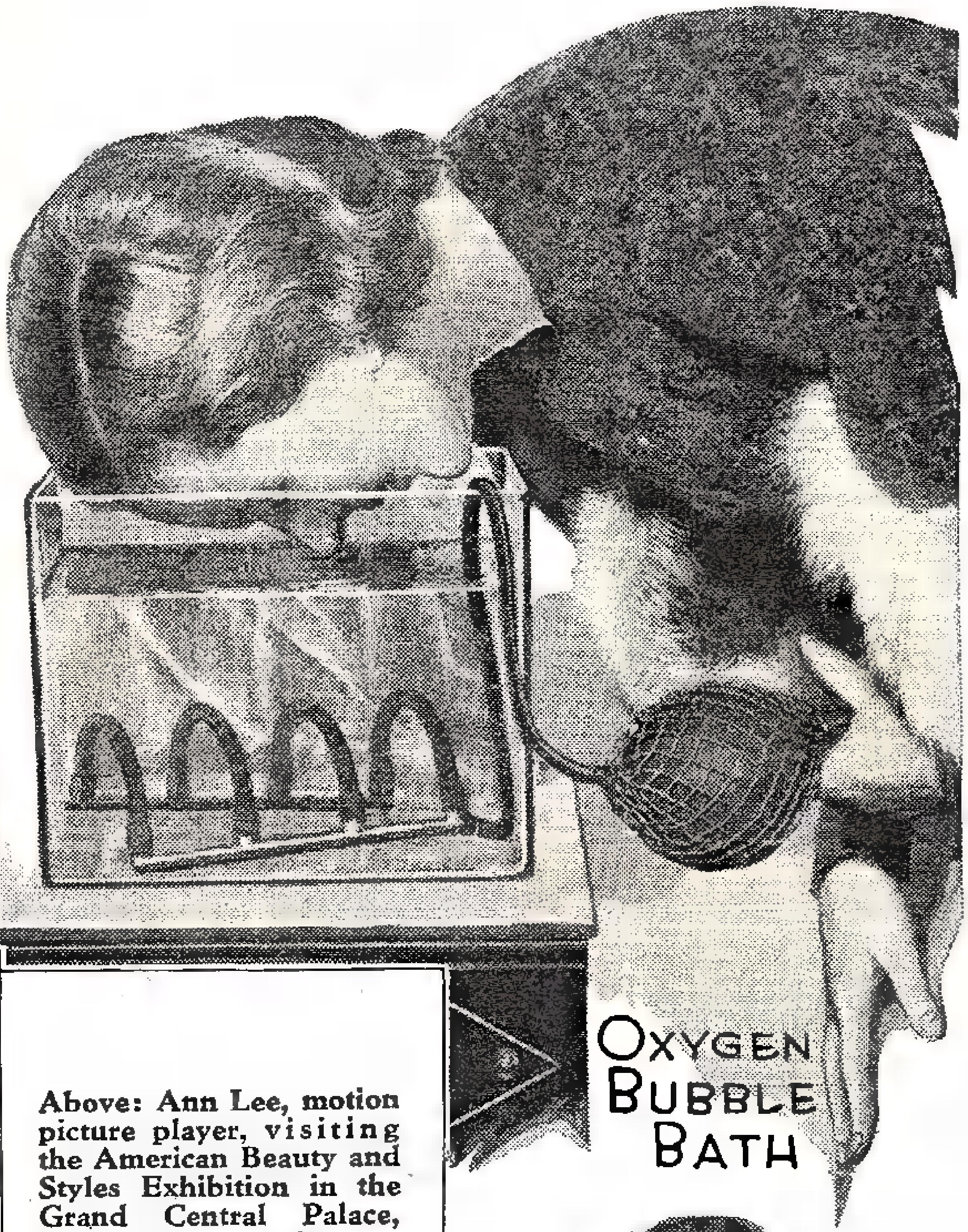
For cooling bottled beverages a convenient unit is now available which stores the beer in a hexagonal tub over which is a rotary ice chopper which shaves ice cubes into chopped ice. The steak waffler shown at the right will make the toughest flank steak taste like tenderloin. The rotary knives break the fibers up into units that cook easily.

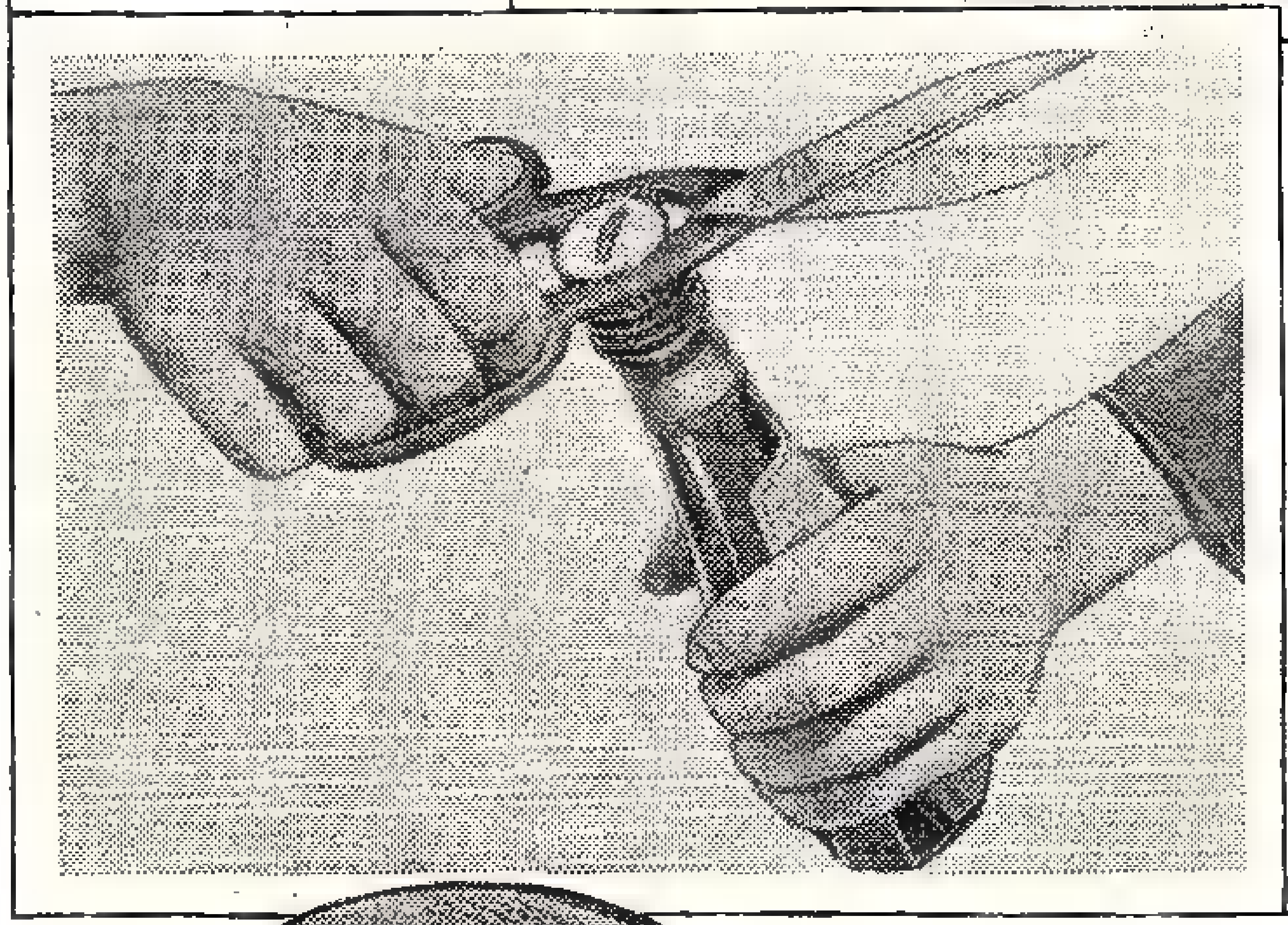
HOUSEKEEPING *Ideas*

Waffled steaks, oxygen beauty baths and serve-all scissors are among the latest gadgets introduced to the home.

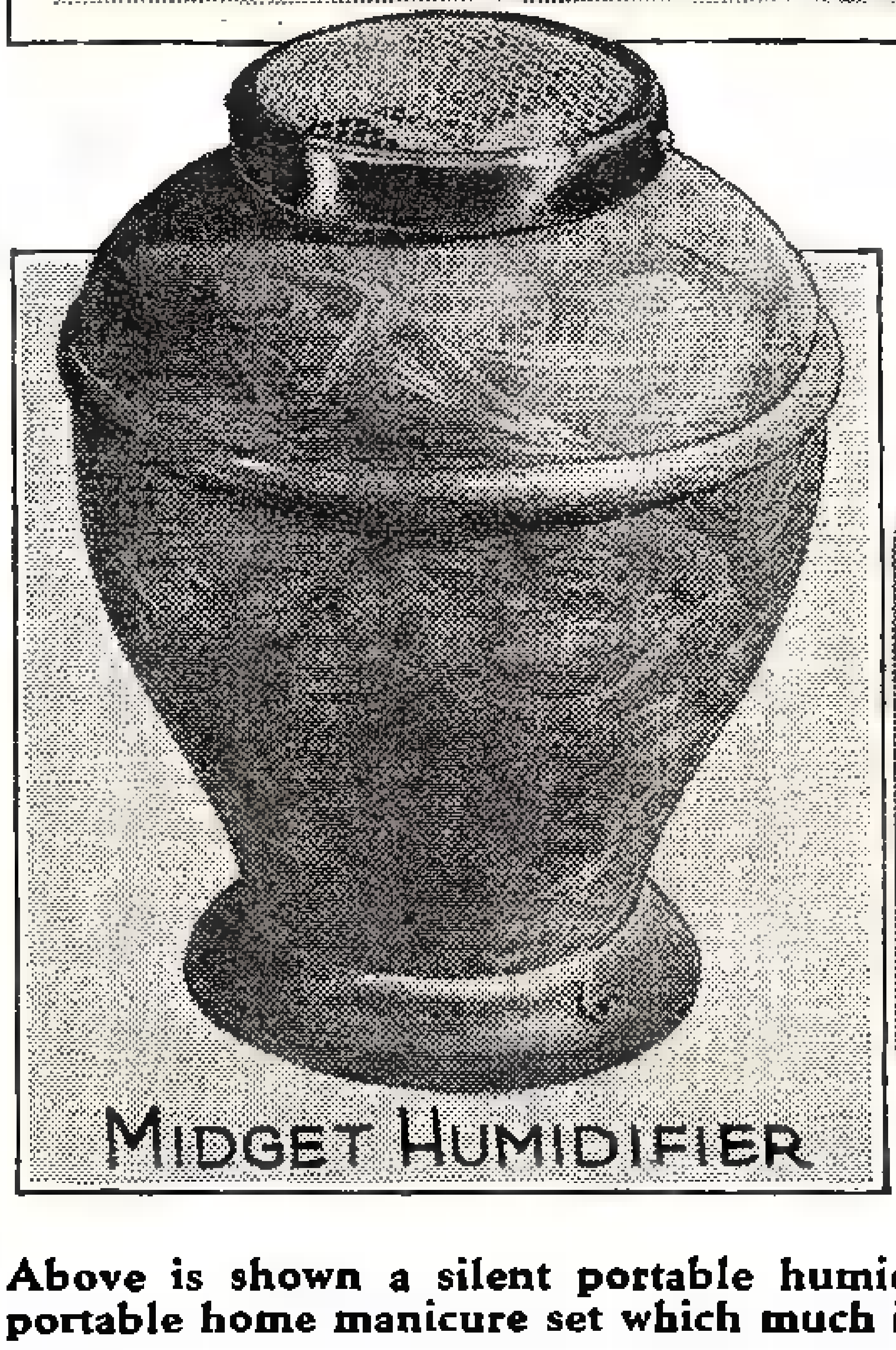


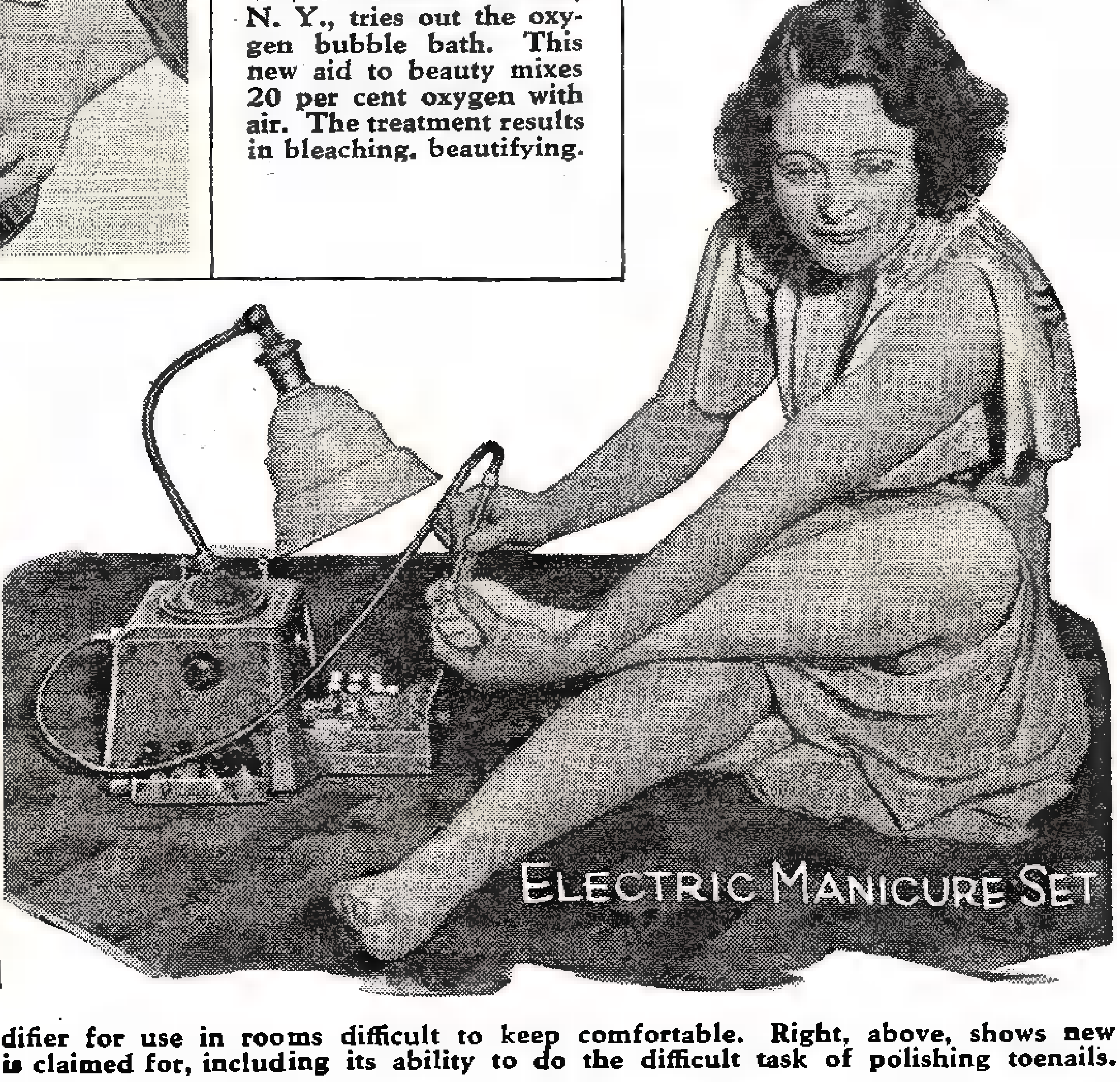
These all-purpose kitchen scissors have been recently introduced to serve many purposes in the kitchen. Vegetable slicer, bottle opener and cap puller are included in its many uses.





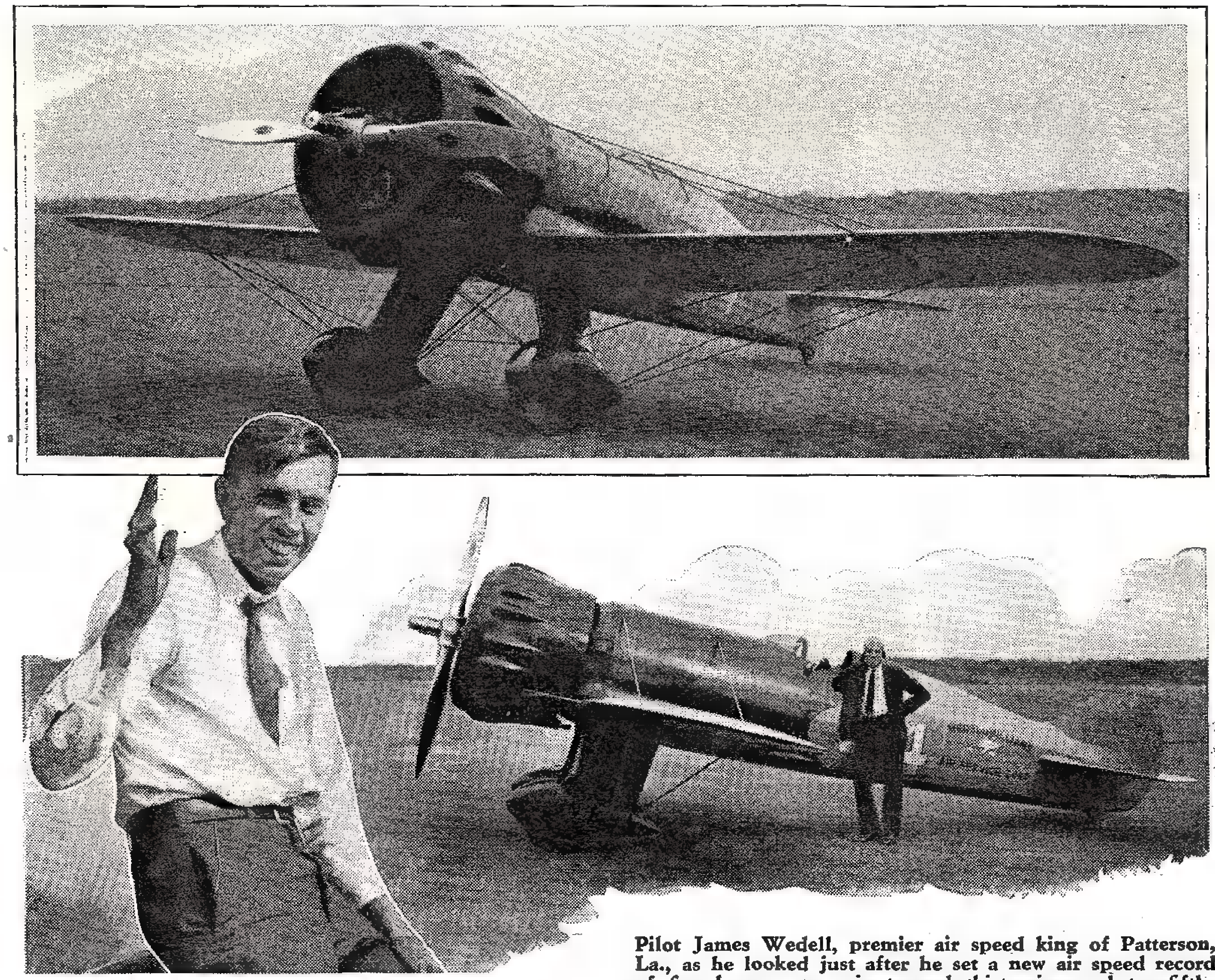
Above: Ann Lee, motion picture player, visiting the American Beauty and Styles Exhibition in the Grand Central Palace, N. Y., tries out the oxygen bubble bath. This new aid to beauty mixes 20 per cent oxygen with air. The treatment results in bleaching, beautifying.





Above is shown a silent portable humidifier for use in rooms difficult to keep comfortable. Right, above, shows new portable home manicure set which much is claimed for, including its ability to do the difficult task of polishing toenails.

COWBOY is Air Speed King



Pilot James Wedell, premier air speed king of Patterson, La., as he looked just after he set a new air speed record of five hours, one minute and thirty-nine and two-fifths seconds between New York and Miami for a purse posted by Col. Henry L. Doherty. The ship is of Jimmy's own design, a Wedell-Williams racer which holds the world's record of 305.33 miles per hour. Jimmy got his start roping Texas steers.

A RED and black monoplane flashed past the packed stands in the International Air Races at Chicago at five miles a minute.

One of the judges looked at his stop watch and grinned.

"That's just a bronco buster riding hard," he said. "Jimmy Wedell's in a hurry again!"

The story of how a Texas cowboy corralled a world's speed flying championship is another American epic of opportunity, one with its genesis in a boy's liking for riding and tinkering. It began on a cattle ranch in Texas before the World War.

Started Out in Texas

The world is asking: Who is this Wedell who garnered newspaper headlines? Five-miles-a-minute Jimmy is a quiet, modest fellow in his thirties, a small package of five feet eight in height and poundage little more than 130. He has brown hair which is always rumpled over his forehead, and blue eyes and a smile. His browned cheeks spell out-of-doors.

He was a kid punching cows on a ranch in Texas, a contented boy in a world of steers and horses, bacon and beans. He rode herd, a-singing—"I been punching Texas cattle on the Lone Star trail, singin' ki yi yippi yappi yay, yap-pi yay—"

But one day in town he drifted into a garage and heard motors. He helped a friend tinker with a motorcycle, and accepted a dare to do some "cycle busting." He climbed aboard this new kind of bronco and took it for a rip-snorting dash through the town.

When he went back to the ranch he kept hearing that motor. He sang then: "Well, I'll sell my saddle and I'll buy me a pow, and I'll swear begad, I'll never rope another cow!" He packed his overalls and went to town and got a job in the garage. Texas horses were too slow. He wanted to go places fast.

He punched flivvers and wrangled wrenches. Jimmy and motors seemed to have a natural affinity. In a week he knew exactly what was inside a flivver. When the motorcycle was pushed in again for repairs Jimmy worked on it after hours without charge.

(Continued on page 136)

Winners of the Cigarette Holder Contest

Here are some of the many entries that were submitted in Modern Mechanix' $150 novel Cigarette Holder Contest.

ANNOUNCEMENT of a $150 contest for novel and different cigarette holders in the November issue brought a flood of entries to the offices of MODERN MECHANIX AND INVENTIONS.

The judges had little difficulty awarding the first three prizes as the winners were outstanding, but it took much consultation to decide on the other ten prize winners.

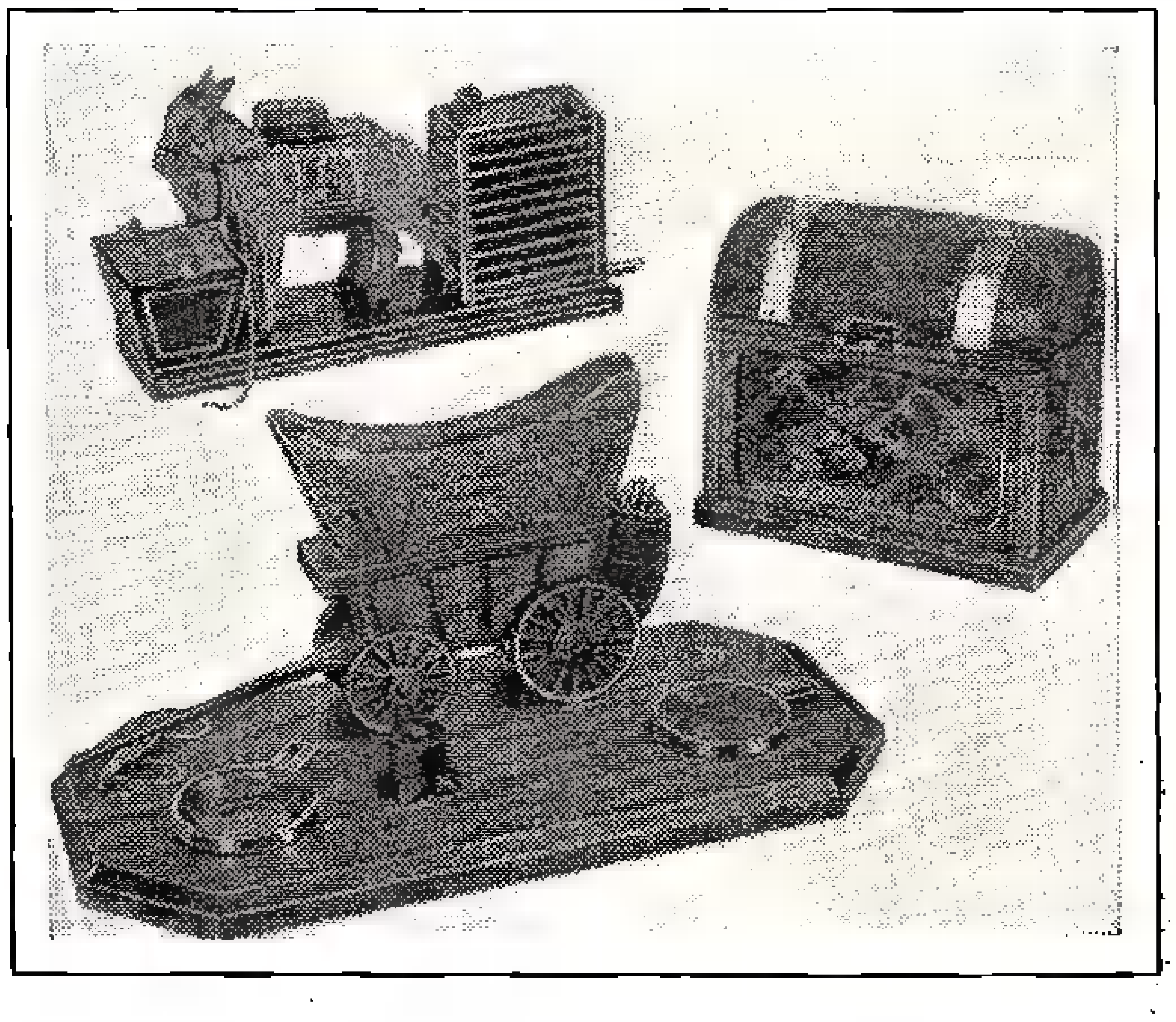
First prize of $75 went to Oscar E. Olson, of Minneapolis, whose entry was the best example of fine workmanship. The central idea was a "Conestoga wagon," used by western pioneers. It was built to scale and under the covered upper section of the wagon was a receptacle for cigarettes and matches. A stump near the wagon is used for snuffing cigarettes and two trays are provided for the ashes.

Second prize of $40 was awarded to H. O. Slipp, of Sioux Falls, S. D., for an entry that combined good workmanship with ingenuity. It is Davy Jones' Locker in which the cigarettes and matches are hidden. The lower part of the chest is cut away and by an ingenious arrangement of plates of glass, on which fish and sea plants were painted, an illusion of underwater life was created.

Third prize of $25 was given to Louis Mika, of Chicago, for the best of the novelty cigarette holders submitted. It consists of a pair of donkeys standing before a manger that is the ash tray. By pushing down the head of either donkey a mechanism inside the body causes a hind leg to kick out a cigarette.

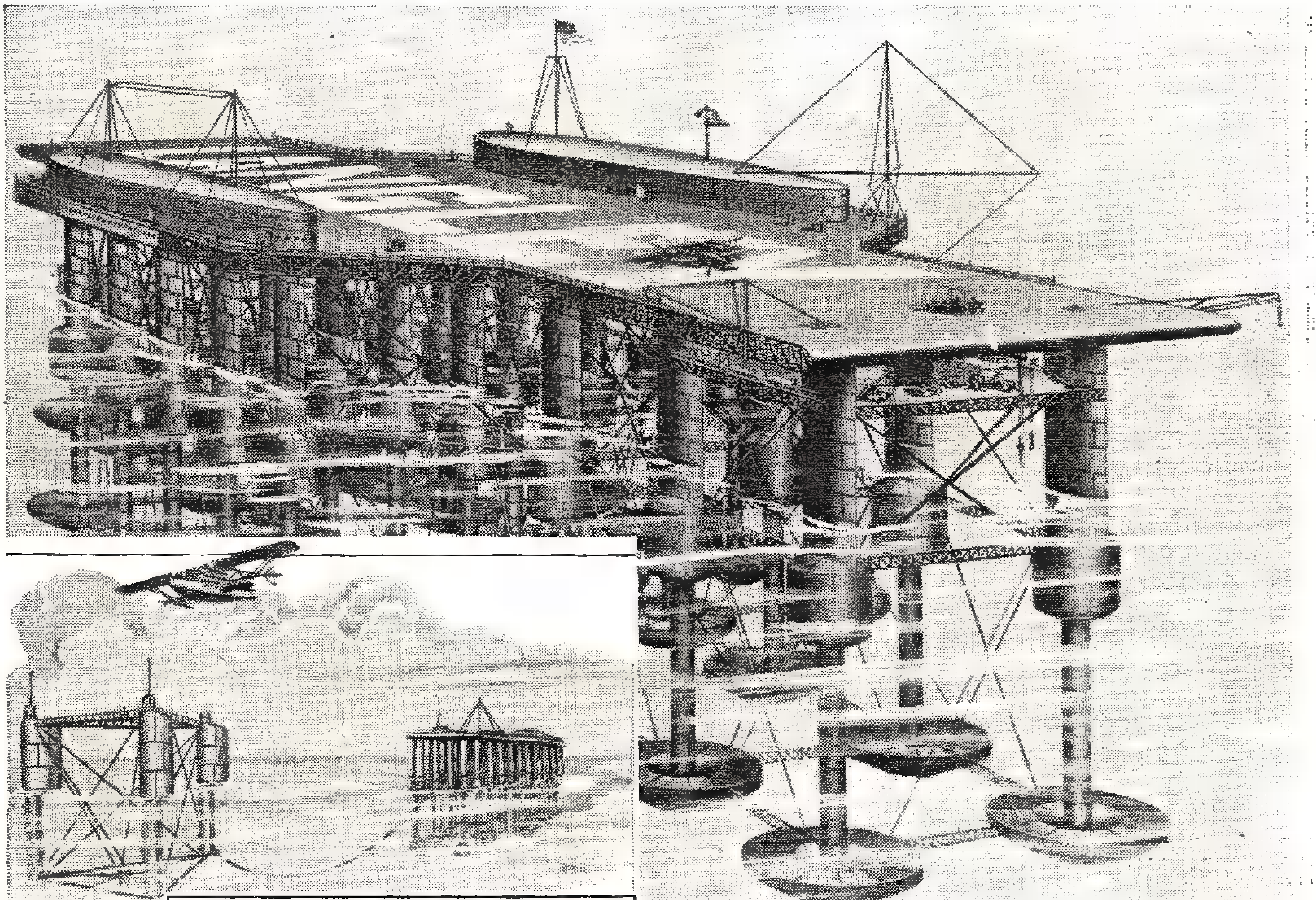
Ten fourth prizes of $1 each went to H. J. Seckel, Marion, O.; Gene E. Stemmer, Upper Sandusky, O.; Thomas Gaskell, Albany, N. Y.; John N. Mattson, Stanchfield, Minn.; Jacob Gerbig, Baltimore, Md.; M. G. Hartley, Gasport, N. Y.; Charles J. Campbell, Madison, Wis.; M. Charles Iverson, El Paso, Texas; Edgar Hiler, Douglas, Arizona; and Arthur Gifford, Los Angeles, Cal.

Many of the builders forgot some important points in constructing their entries. Cigarettes in the open air dry easily, while some discharging devices crushed them.

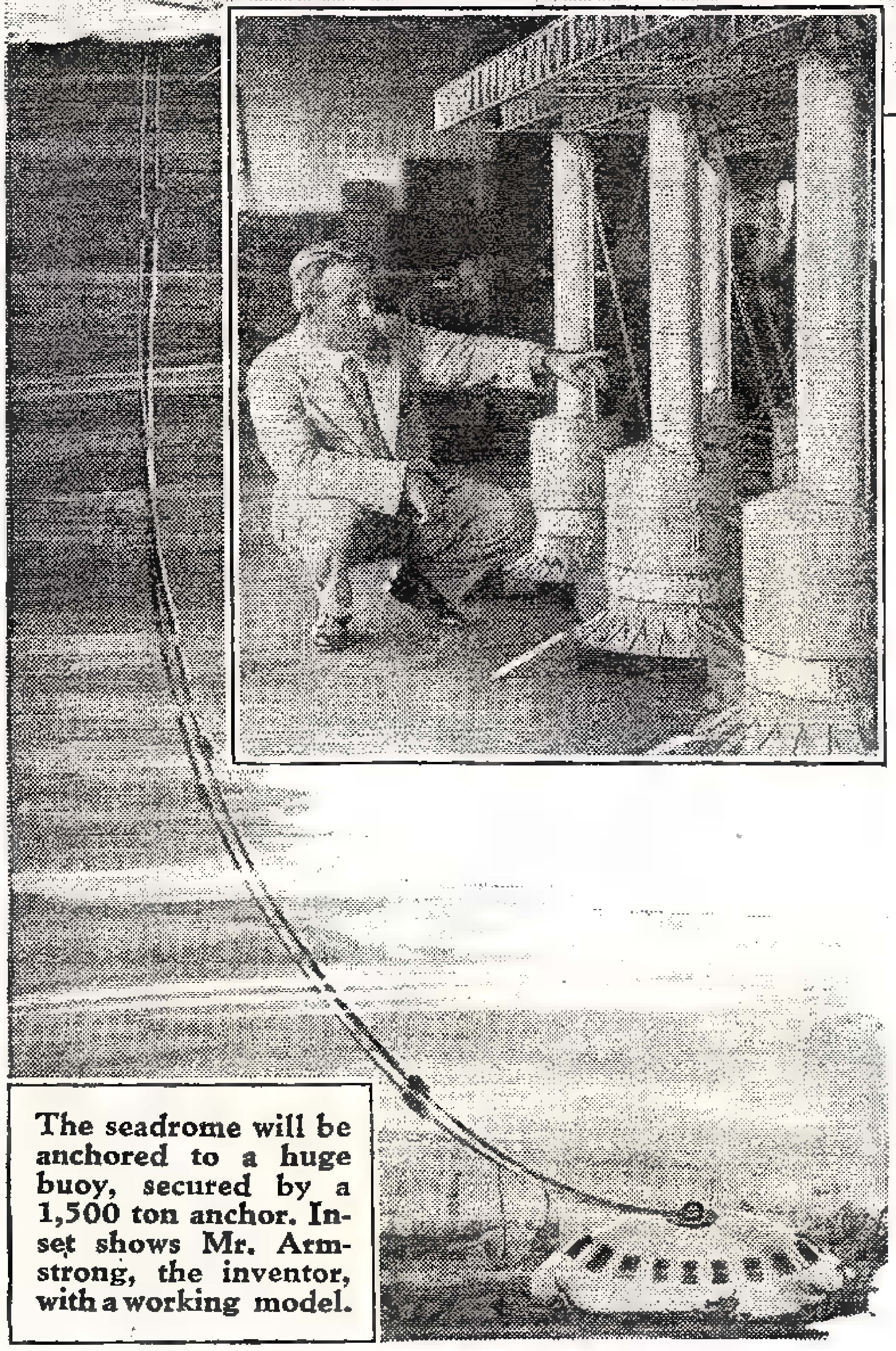


The covered wagon in the foreground won the first prize of $75. At right Davy Jones' Locker with a view of undersea life took the $40 second prize. Third ($25) prize went to the mules that kick out cigarettes by pushing heads down.

FLOATING AIRPORTS



Here is what the full sized Armstrong seadrome will look like when completed. At first but one-fourth of it will be built, the more economically to test the flotation principles of the submerged ballast tanks. Later the complete six-acre field may be built, with hotels at the side as shown or else on a lower deck, according to what tests prove.



The seadrome will be anchored to a huge buoy, secured by a 1,500 ton anchor. Inset shows Mr. Armstrong, the inventor, with a working model.

by BEN LINCOLN

FUNDS recently appropriated by the government have put the United States Department of Commerce, Aviation Branch, squarely behind the immediate development of a chain of five floating airports which will span the Atlantic for regular airways service.

This recently announced appropriation, amounting to $1,500,000 was negotiated by Eugene L. Vidal, Director of Aeronautics of the Department of Commerce, in behalf of Edward R. Armstrong, inventor of the seadrome, and completes a 16 year fight to gain recognition for a project which both Mr. Vidal, a competent and experienced airways operator, and Mr. Armstrong solidly believe in. As well, it will provide work for a great number of unemployed, as 80 per cent of the cost of such development projects goes to labor.

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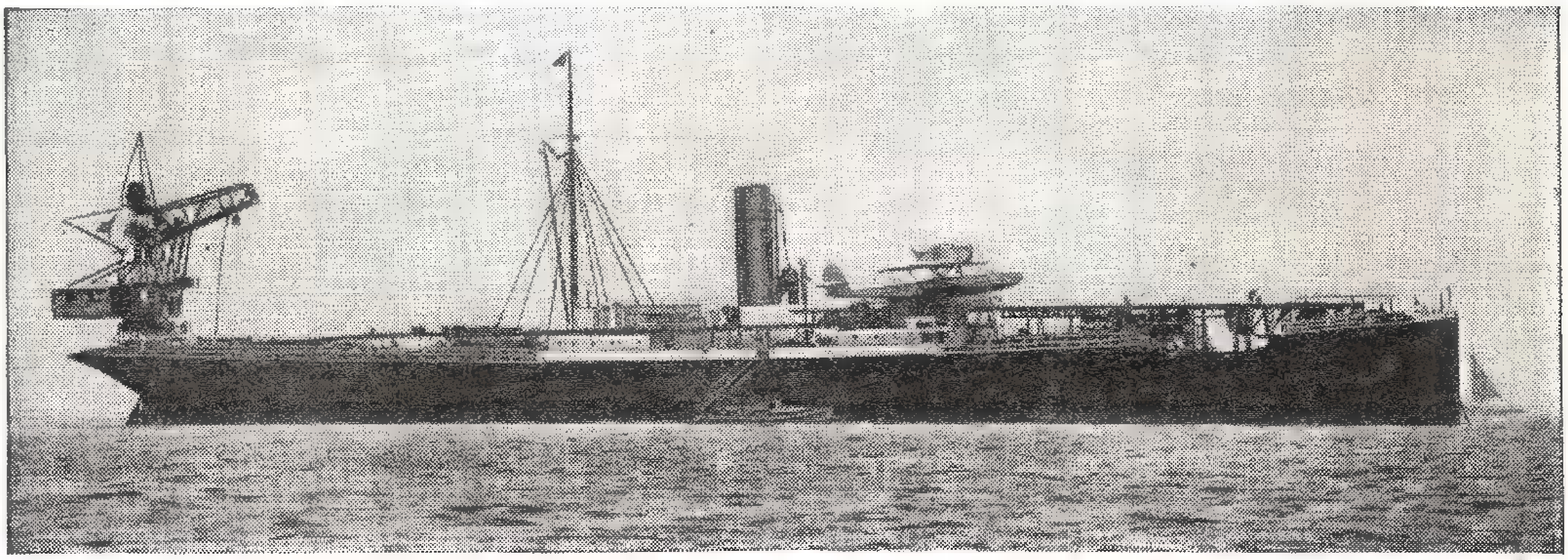
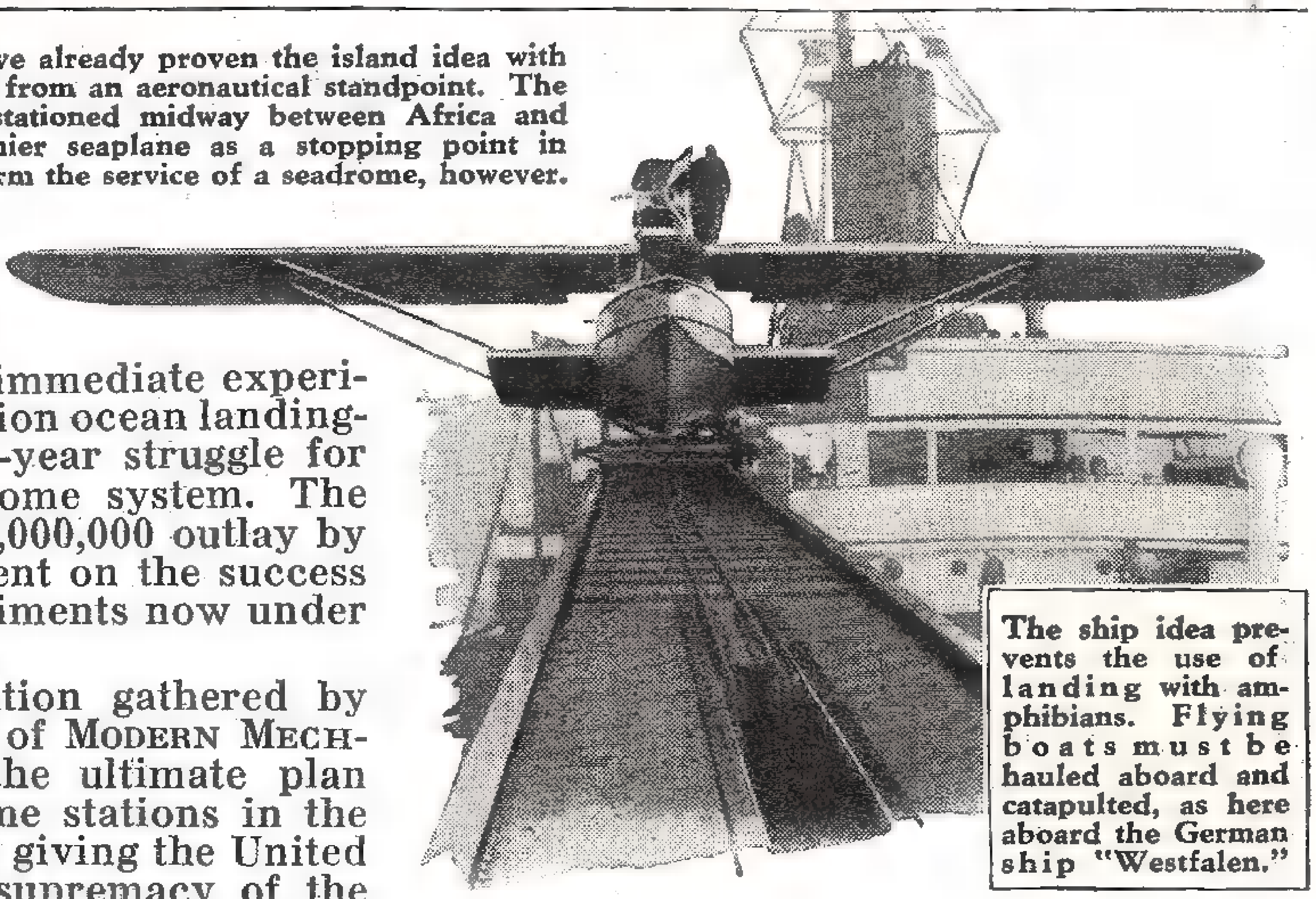


The ever enterprising Germans have already proven the island idea with a ship, thus proving the feasibility from an aeronautical standpoint. The "Westfalen," shown above, was stationed midway between Africa and South America, serving the Dornier seaplane as a stopping point in a recent flight. Ships cannot perform the service of a seadrome, however.



The ship idea prevents the use of landing with amphibians. Flying boats must be hauled aboard and catapulted, as here aboard the German ship "Westfalen."

This $1,500,000 is for immediate experiments with a quarter-section ocean landing-field and ends a sixteen-year struggle for recognition of the seadrome system. The final plan calls for a $30,000,000 outlay by the government, contingent on the success of the preliminary experiments now under way.

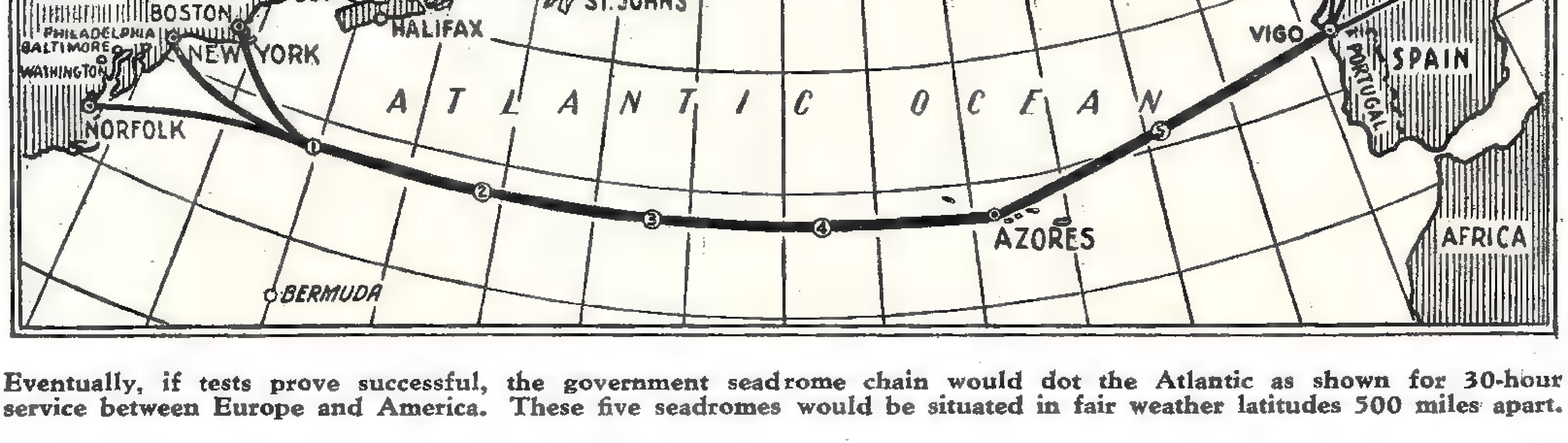
According to information gathered by this member of the staff of Modern Mechanix and Inventions, the ultimate plan calls for similar seadrome stations in the Pacific and other oceans, giving the United States an international supremacy of the air lanes. Great Britain and France both gave the Armstrong plan serious consideration but failed to adopt it.

The proposed system calls for five Armstrong seadromes at 500 mile intervals from the Atlantic seaboard here to the western coast of Europe. Each drome will cost $6,000,000.

Back in 1927 when Armstrong completed his first models of the floating deck, he intended to have hangars and hotels on the six-acre surface. But the design which has been accepted by the government calls for a vacant deck, with hangar and hotel accommodations confined to two or three decks below the surface.

The seadromes will be 1,225 feet long and 300 feet wide. An elevator will take planes

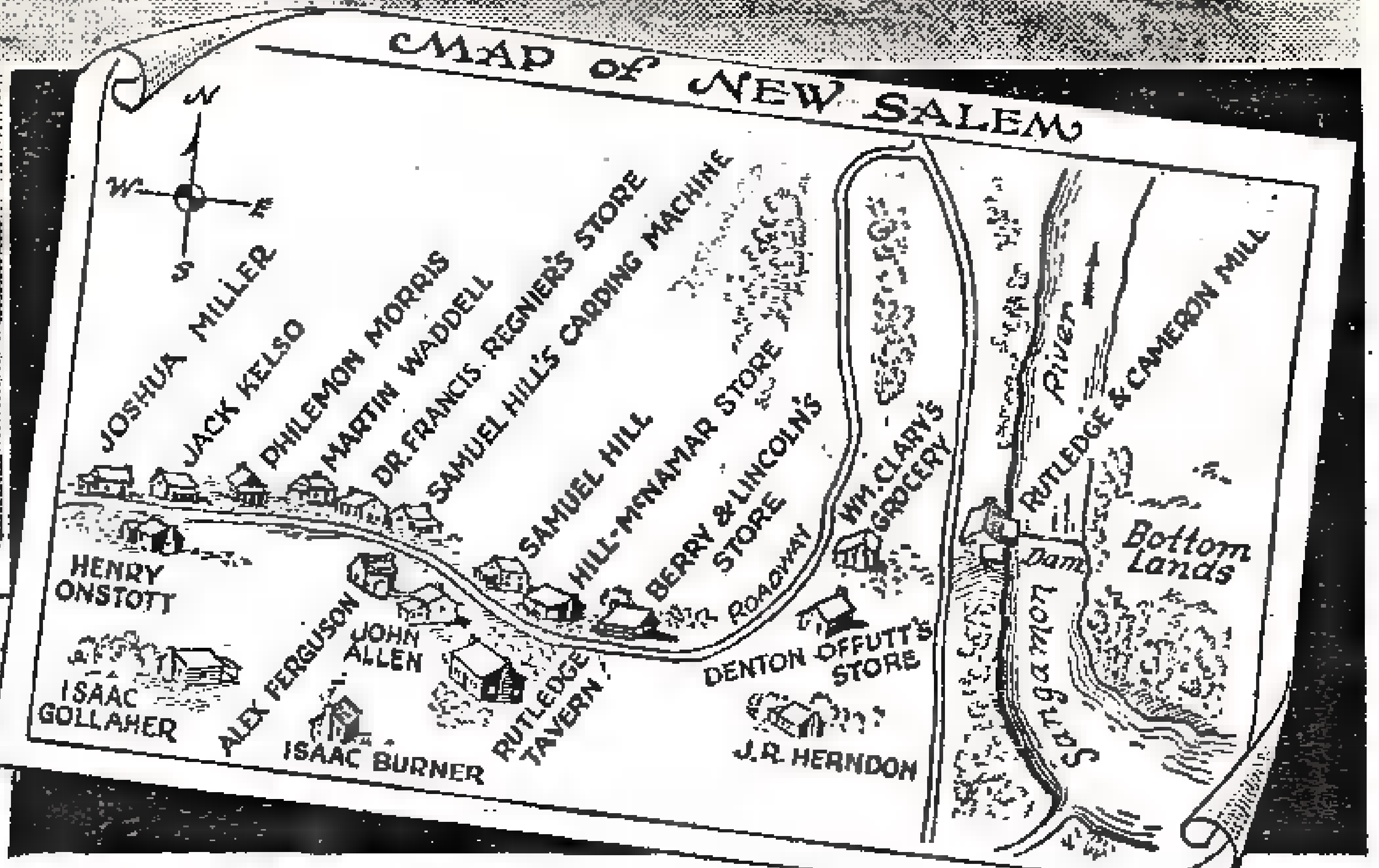
(Continued on page 138)



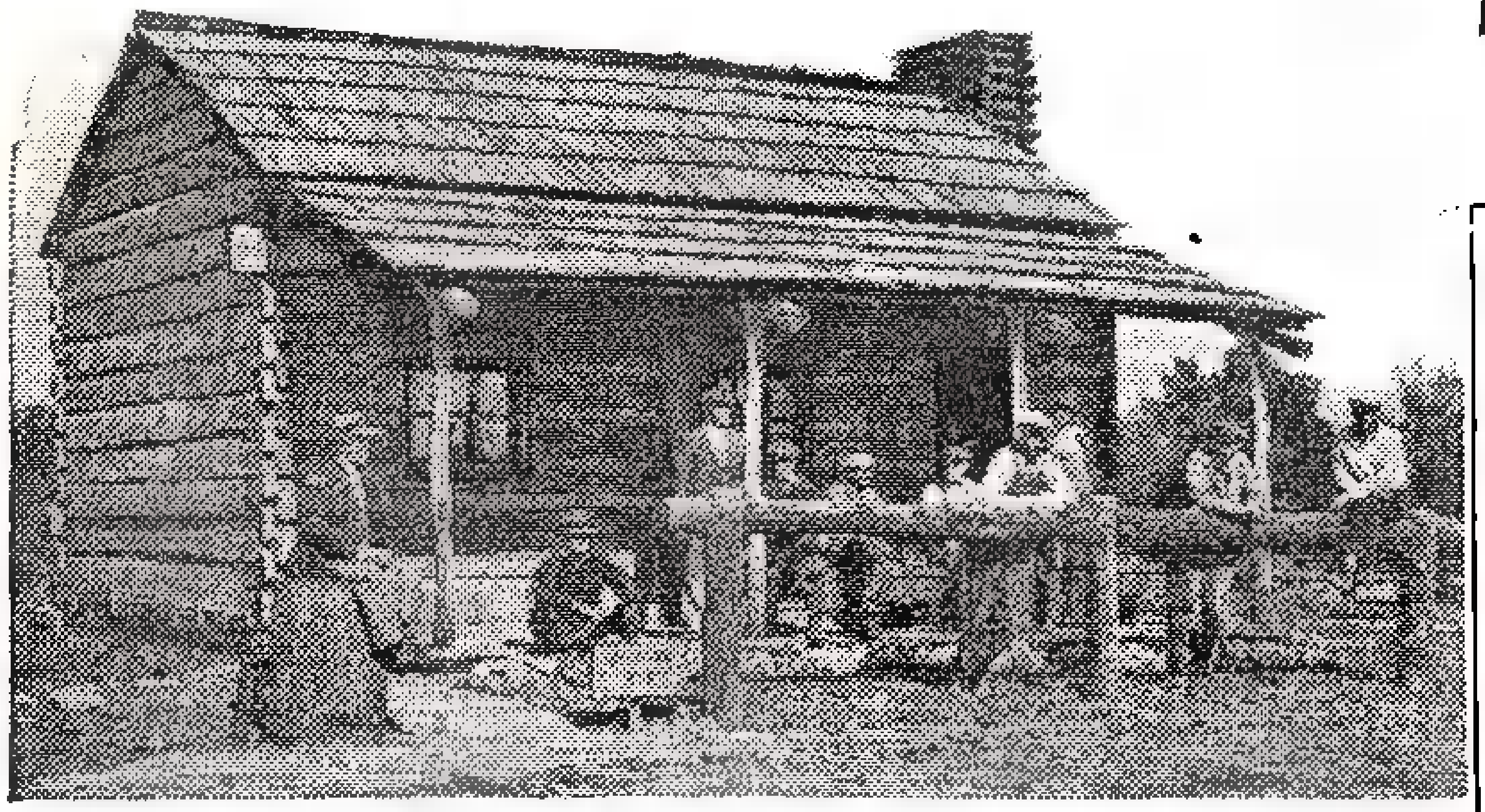
Eventually, if tests prove successful, the government seadrome chain would dot the Atlantic as shown for 30-hour service between Europe and America. These five seadromes would be situated in fair weather latitudes 500 miles apart.

Abraham Lincoln's Old Town Rebuilt

Main street in New Salem, Ill., rebuilt as a shrine to Abraham Lincoln, is shown above. Buildings are replicas.


MAP of NEW SALEM
N
W
E
S
JOSHUA MILLER
JACK KELSO
PHILEMON MORRIS
MARTIN WADDELL
DR. FRANCIS REGNIER'S STORE
SAMUEL HILL'S CARDING MACHINE
SAMUEL HILL
HILL-McNAMAR STORE
BERRY & LINCOLN'S STORE
ROADWAY
WM. CLARY'S GROCERY
RUTLEDGE & CAMERON MILL
River
Dam
Bottom Lands
Sangamon
HENRY ONSTOTT
ISAAC GOLLAHER
ALEX FERGUSON
JOHN ALLEN
ISAAC BURNER
RUTLEDGE TAVERN
DENTON OFFUTT'S STORE
J.R. HERNDON

This old map shows New Salem as Lincoln knew it over a hundred years ago. Here he courted Ann Rutledge.



In this building, the Hill and McNamar store, Lincoln served as postmaster in a career leading to President.

IN THE only undertaking of its kind ever attempted, Illinois has rebuilt New Salem, home of Abraham Lincoln from 1831 to 1837.

This collection of log cabins, stores and workshops has been rebuilt as a national shrine to the young man who arrived there penniless and left it as a step in a career that led to the White House.

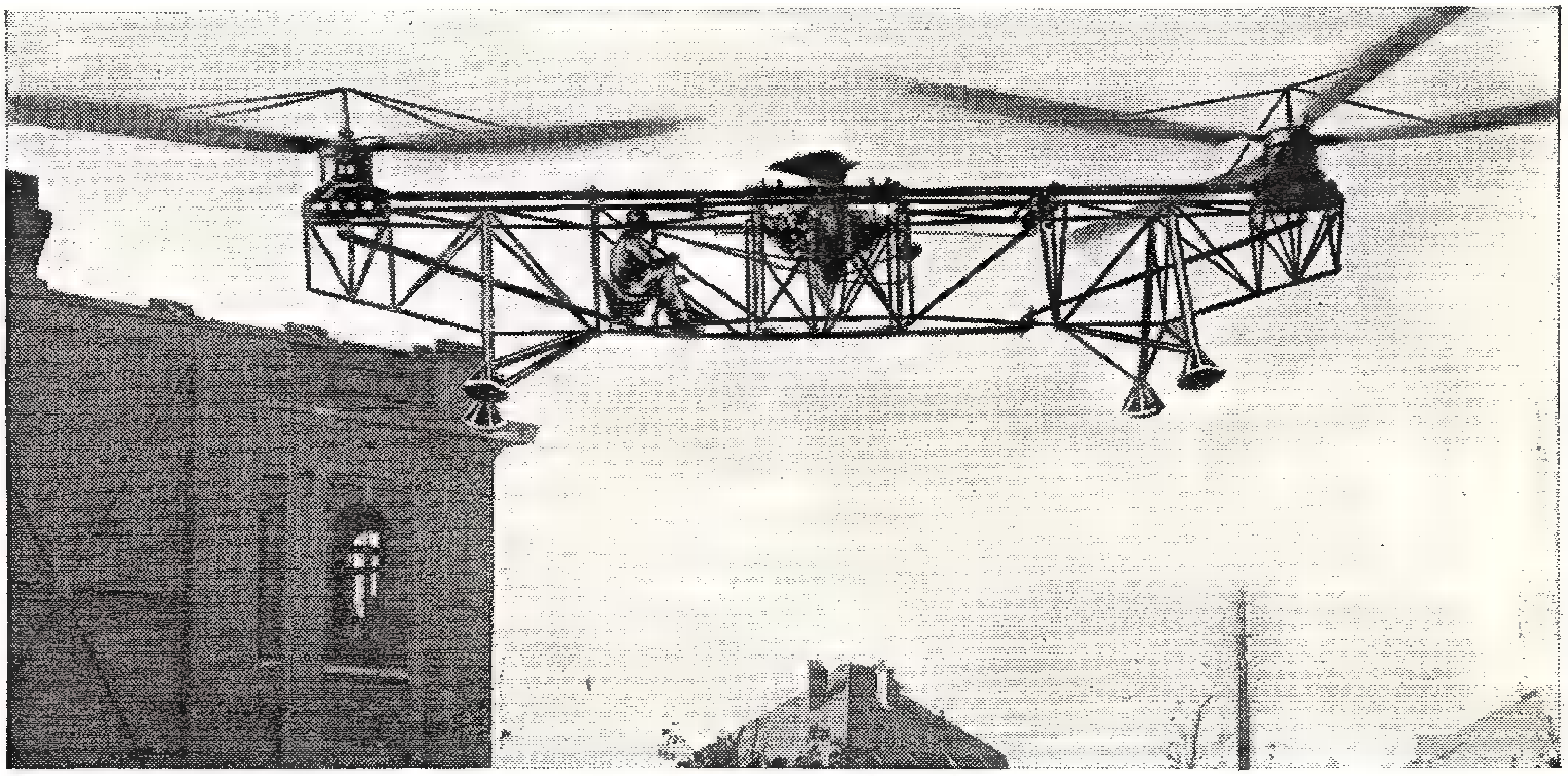
Thirteen of the original nineteen buildings have been finished and furnished in many cases with the original furniture.

The only modern structure in the village is the Lincoln Museum which in the future will be hidden by trees. Otherwise the village stands just as it did when Lincoln was postmaster and storekeeper and courted Ann Rutledge.

The large Rutledge Tavern has been built with the original well from which Lincoln drew his drinking water. Next to the Henry Onstott home is the original workshop where Lincoln studied law by reading Blackstone by the light of burning barrel shavings.

Restored interior of Samuel Hill home shows the spinning wheel, old clock and other furnishings of the 1830's.

Belgian Helicopter Stays Aloft 10 Min. to Set Record



Queer Belgian wingless helicopter stays in air nine minutes and fifty-eight seconds to set new world's record for vertical ascent by heavier-than-air craft. Two autogyro-like blades driven by a centrally mounted engine provide lifting power.

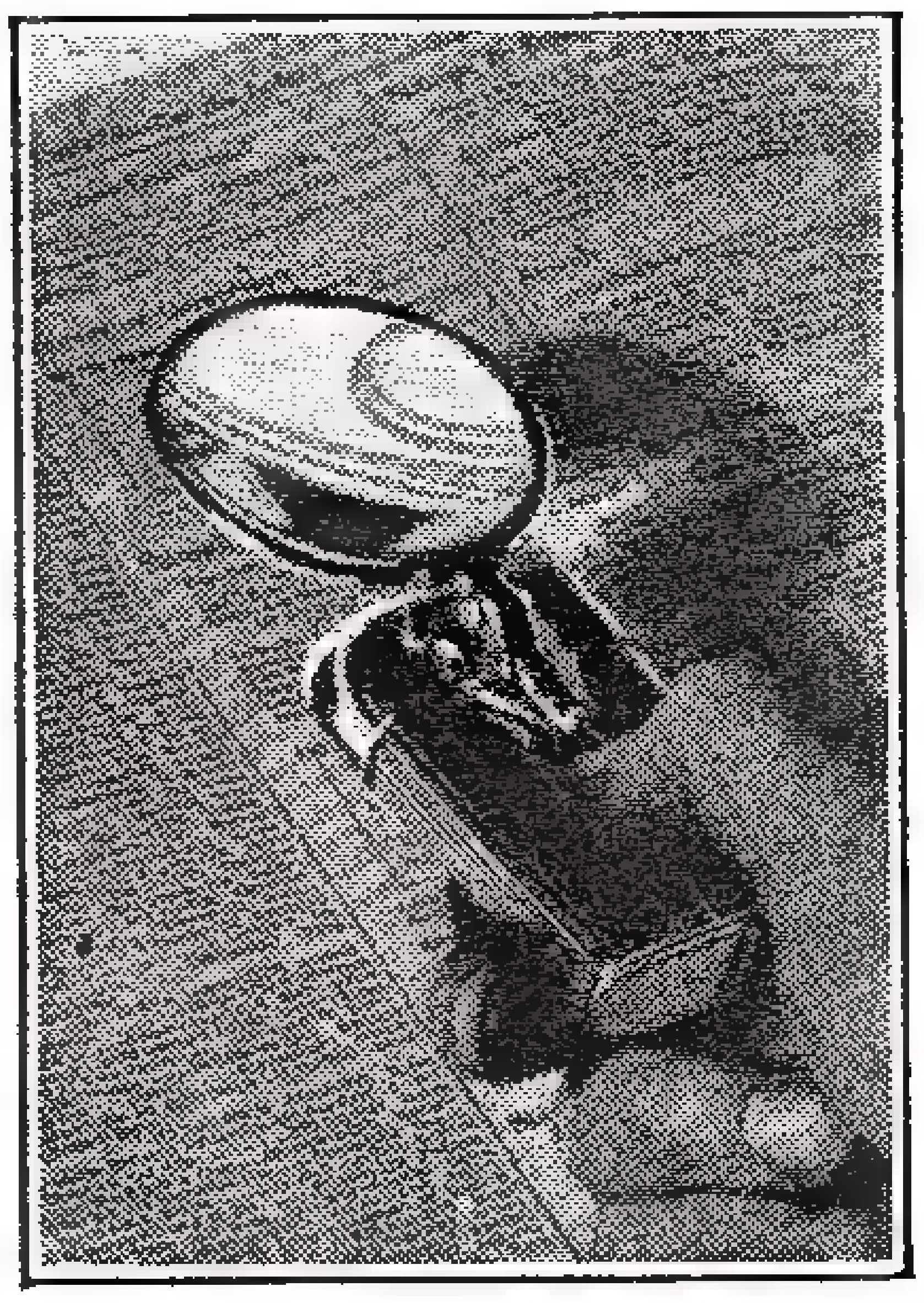
A QUEER Belgian helicopter, entirely without wings, recently set a new world's record for heavier-than-air craft designed for vertical ascent by remaining in the air for 9 minutes and 58 seconds.

The strange craft has a centrally located aircraft motor mounted on a framework of steel tubing.

Four-bladed propellers of hinged construction similar to the blade of an autogyro are mounted at each end of the framework, and driven through gears and a steel driveshaft by the one engine.

The operator sits on a precarious perch to one side of the engine, the motor being just enough off center to balance his weight. Four feet-like projections at the bottom absorb part of the shock in landing, and take the place of the undercarriage of a plane.

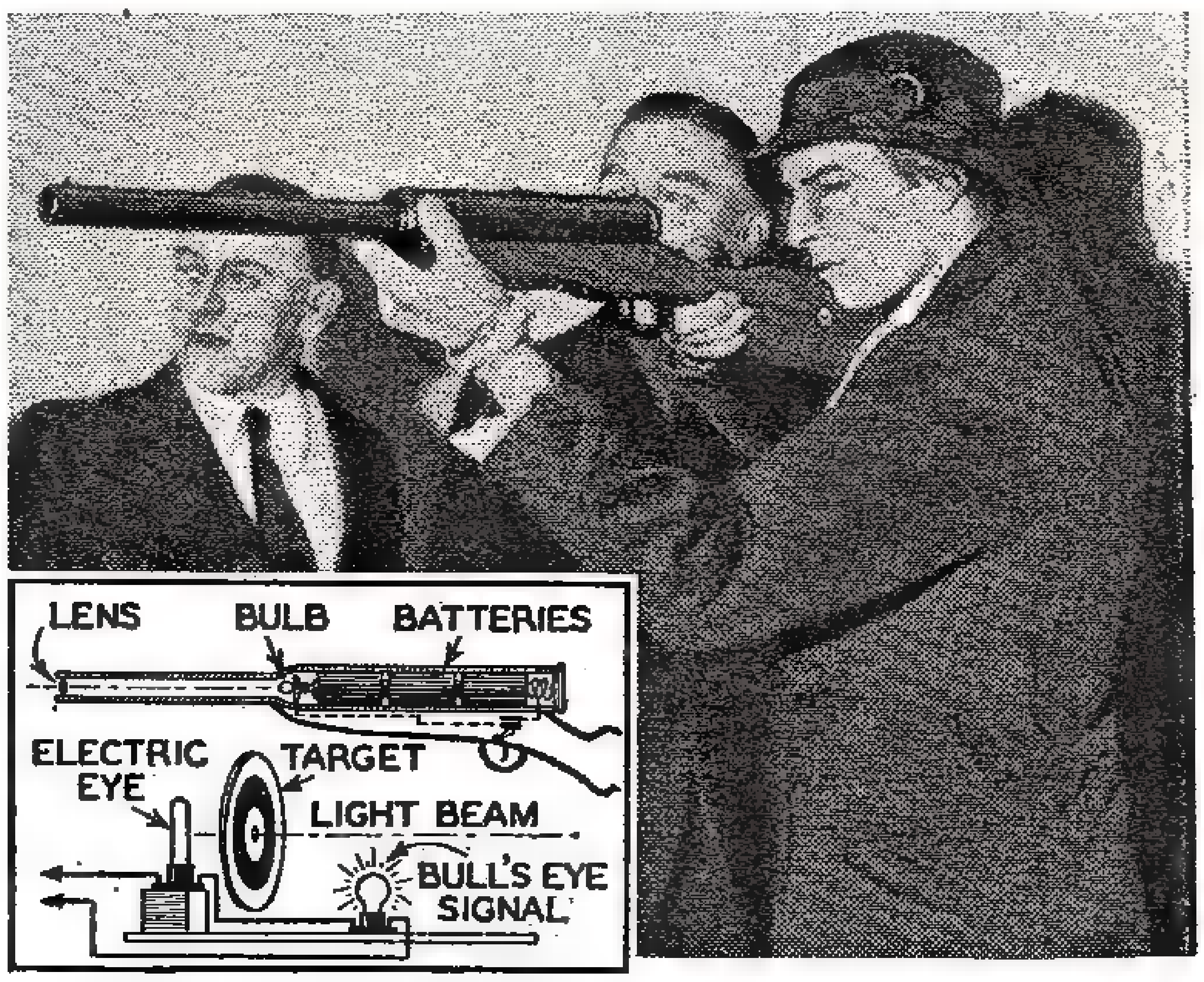
Flashlight for Difficult Reading



Flashlight illuminates the reading matter while glass magnifies.

A VEST pocket size combined flashlight and reading glass concentrates its light on the spot directly below the powerful glass. When not in use, the glass folds back compactly against the body of the light. It can be used to advantage in studying fabrics, old manuscripts, fine printing, and delicate etchings.

New Rifle Shoots Beam of Light

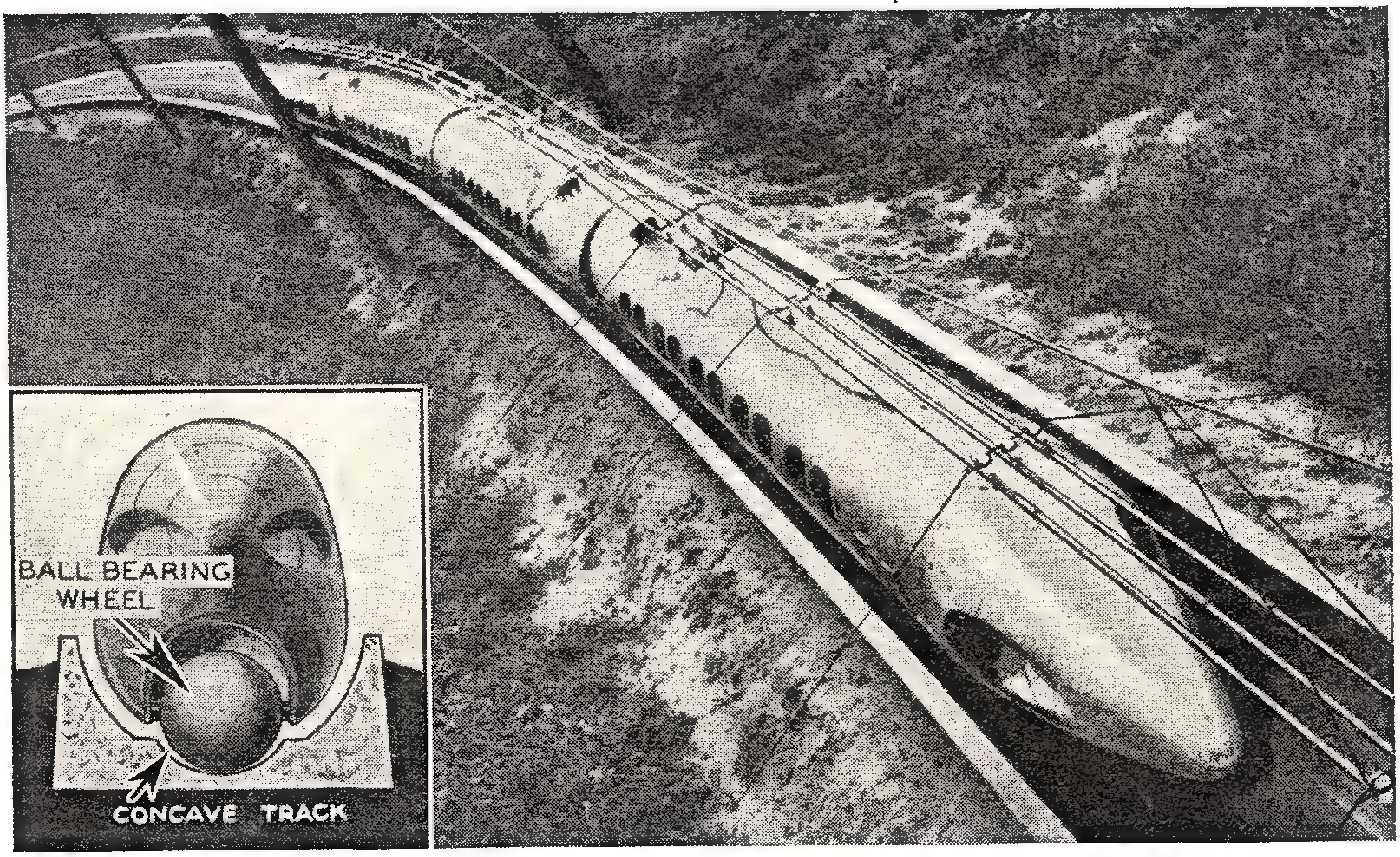


"Shadolite" gun, invaluable for target practice, shoots a beam of light. An electric eye behind hole in bull's eye of target operates signal when hit by light beam of gun.

AN INVENTION of considerable interest to rifle enthusiasts is the "Shadolite" gun. Without ammunition of any kind, this new gun registers bull's-eyes and misses just as does an ordinary rifle.

A powerful flashlight mounted inside a nine gauge shotgun flashes a beam of light at the target for any set interval of time ranging from zero to 30 seconds. A photoelectric cell mounted behind a hole in the center of the target causes a relay to operate when the rifle is correctly aimed, thereby lighting a signal lamp. The aim of the gun may be corrected within the time length of the bullet beam.

Russia's Giant Snake Train Rolls Speedily on Steel Balls



Russia's newest electric train rolls on huge steel balls in grooved concrete track. Sunken windows at the front of the streamlined engine give train appearance of huge reptile. Final model is expected to run 190 miles per hour.

AN ELECTRIC train which travels on steel balls instead of wheels has been tested in Russia with remarkable success.

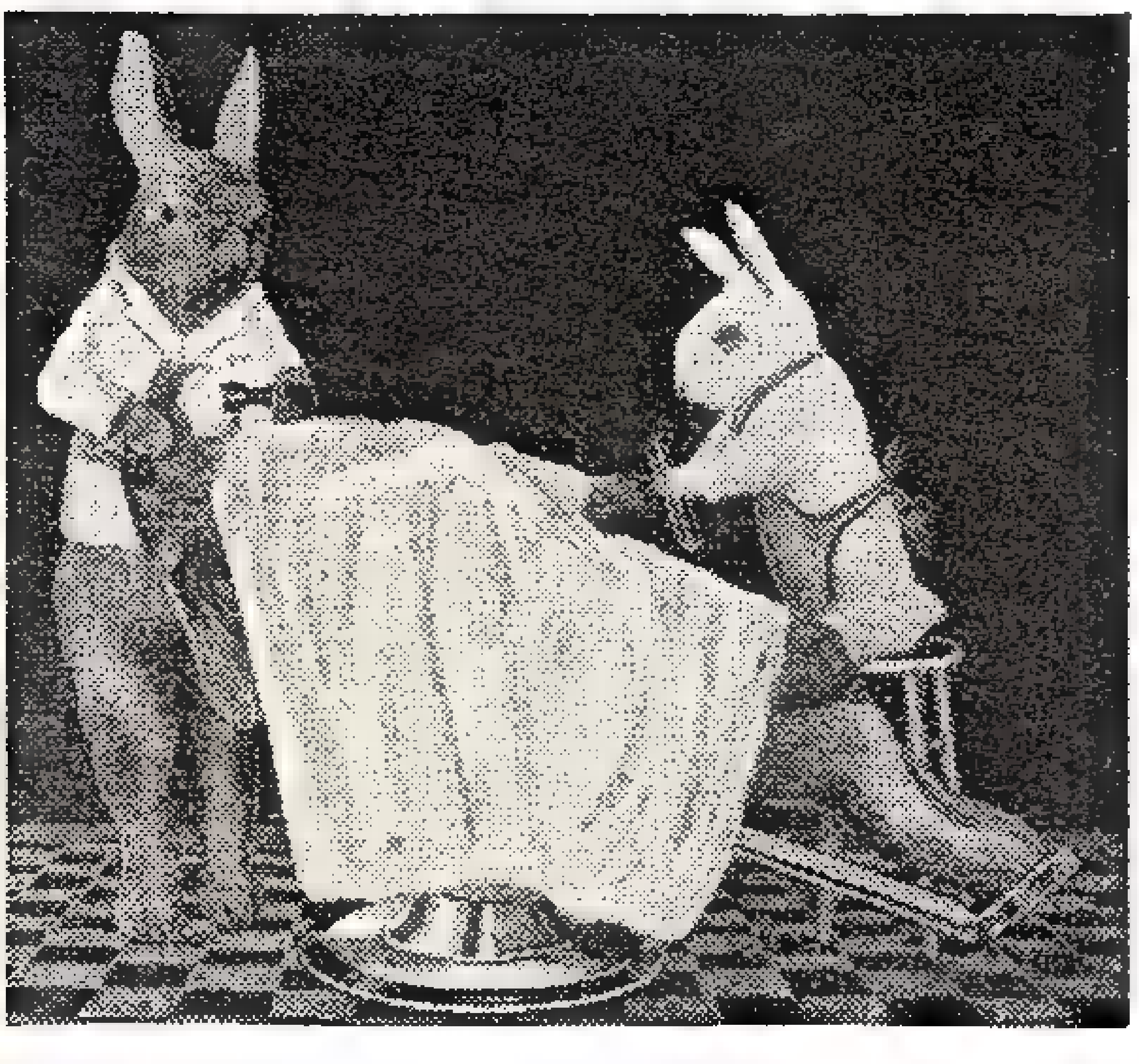
The speedy train, which was designed by a young Soviet engineer named Yarmolshuk, resembles a giant reptile weaving about the countryside. The inventor declares his final design will have a running speed of 190 m. p. h.

Huge balls under each car roll on a single concave concrete track, greatly reducing rolling friction. Gyroscopes in each car keep the train balanced even on the sharpest curves, and curved guards along the track prevent the train from tipping.

Mounted Animals Mimic Humans

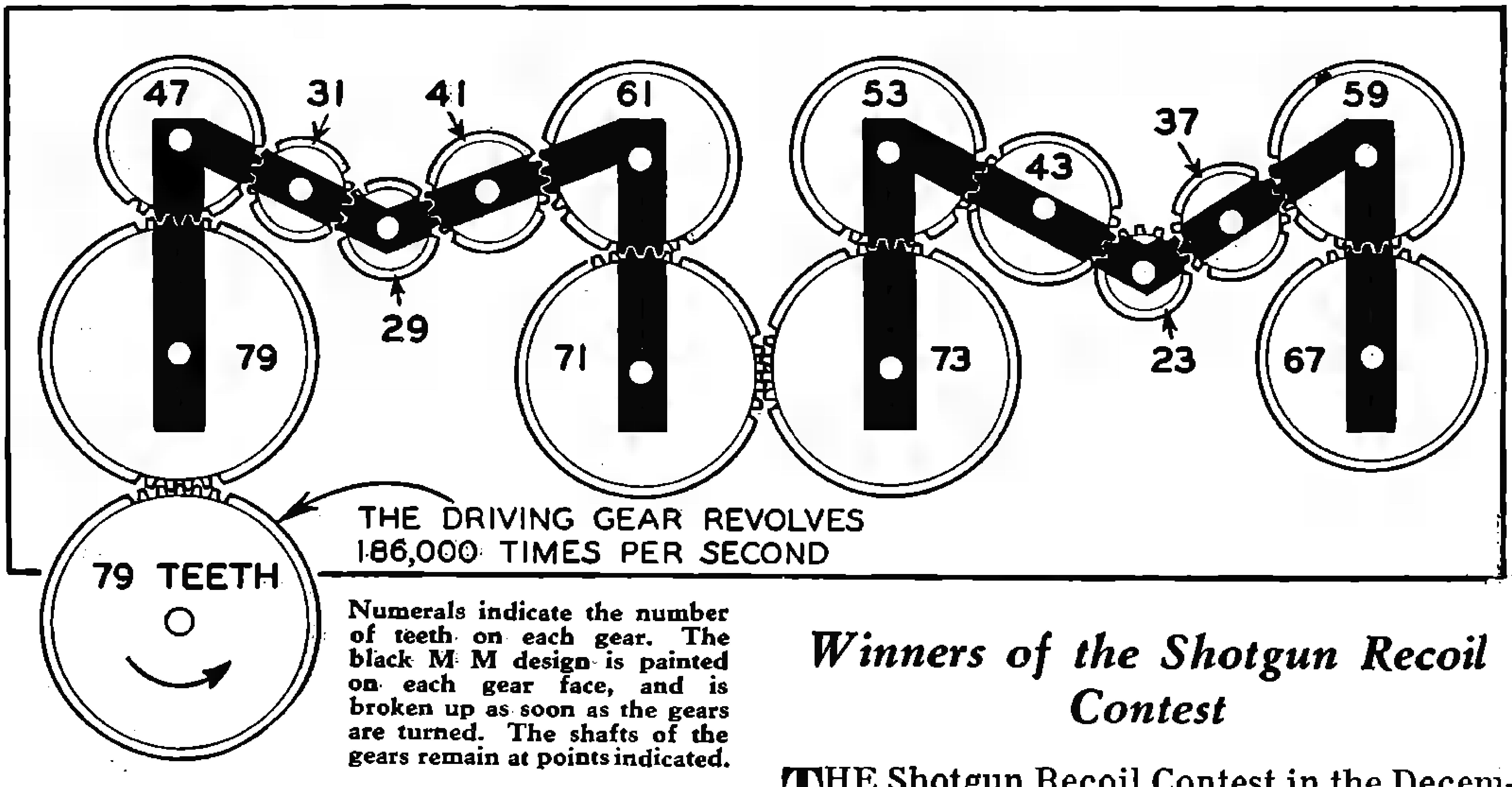
HUNTERS are using taxidermy more and more to preserve game specimens as mementos of enjoyable hunting trips. Mounted animals are being worked into useful articles for the home, such as table lamps, book ends, gun racks, and ash trays.

Interesting groups picturing animals at some humorous occupation are finding great popularity as store window exhibits as well as for the hunter's den. Rabbits, squirrels, birds, and even frogs can be mounted and arranged to represent human activities such as shaving, hunting, smoking, or studying.



Sportsmen mount trophies as mementos of thrilling hunting trips. Right: Cleverly mounted rabbits portray a barber shop scene.

$25 in prizes for Solving Gear Problem



THE DRIVING GEAR REVOLVES 186,000 TIMES PER SECOND

Numerals indicate the number of teeth on each gear. The black M M design is painted on each gear face, and is broken up as soon as the gears are turned. The shafts of the gears remain at points indicated.

SHARPEN up your pet pencils, dig up a ream of scratch paper, and get ready for some real fun with arithmetic and gears.

You've all at some time or other watched trains of gears, either turning slowly and noiselessly as in clocks, or grinding noisily together in your automobile transmission.

Well, that's all we have here—a train of gears having different numbers of teeth. With the gears stopped, the letters "M M" were painted on the train, as shown above. Of course, just as soon as the gears turn, the letters "M M" are broken up.

And now for the problem—with the driving gear revolving 186,000 times per second, how long will it be before the gears will again be in position to form the letters "M M" as they are above?

The problem isn't by any means as hard as it appears to be, and most assuredly you won't need differential equations, infinite series, or Binomial Theorems to work it.

You don't have to send your calculations with your solution; just send the answer, and tell, in less than 250 words, how you got it.

For the best solutions to the Gear Problem, Modern Mechanix and Inventions will pay $25, as follows: First prize $10, second prize $5, and four third prizes of $2.50 each.

Your entry should be postmarked not later than February 1, 1934. Decision of the judges, who will be Modern Mechanix and Inventions editors, will be final. In case of ties, duplicate prizes will be awarded.

Employees of this magazine or their families are not eligible to compete. You don't have to be a subscriber to enter this contest, neither do you have to buy a copy of the magazine. Address your entries to Gear Contest, Modern Mechanix and Inventions, 529 S. 7th St., Minneapolis, Minn.

Winners of the Shotgun Recoil Contest

THE Shotgun Recoil Contest in the December issue of Modern Mechanix and Inventions brought a very interesting batch of answers. A great many readers submitted the correct answer, but couldn't tell just why it was correct.

To Raleigh I. Low, Stockton, Kansas, goes the first prize of $10 for the clearest and most accurate answer. Glenn Haglund, 17 year old schoolboy, at Richfield Station, Minneapolis, Minn., receives $5 for his answer and unusually clear statement of the scientific principles involved. Four third prizes of $2.50 each go to J. Howard Kelly, Bristol, Virginia; Lynn Saulsburg, 5 Gilbert St., Le Roy, N. Y.; Jack H. Roberts, 4976 Catoctin Drive, San Diego, Cal., and Leo Schneider, Glen Ullin, N. Dak.

And here is the correct answer, based upon the well-known law of physics that "to every action there is an equal and opposite reaction."

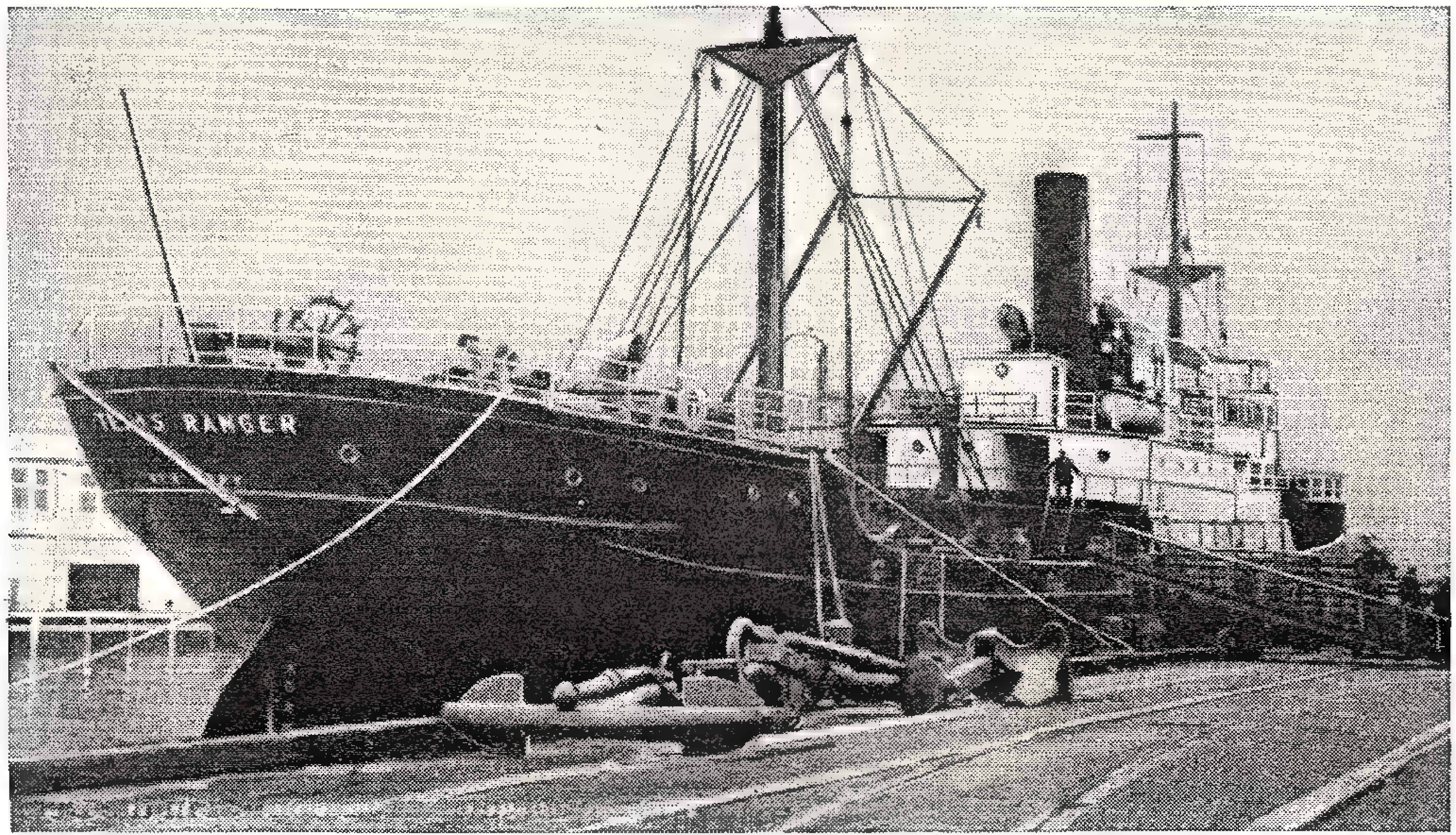
Wherever a force is applied in one direction, there is always an equal force—or combined forces—in the opposite direction.

In the case of the shotgun, whatever force is applied to overcome the inertia of the buckshot and give it initial muzzle velocity is also applied in the opposite direction, producing the recoil. In the case of the blank shell, the little kick is due to the force necessary to impart motion to the stationary column of air in the barrel and to the wadding, and to a rocket effect due to the expanding gases of the powder.

When the gun is placed in a vacuum chamber, obviously the column of air is removed. Therefore, the blank shell will have less kick than in the atmosphere. Since the column of air will also be absent in the barrel with the loaded shell, the kick of this barrel will be exactly as much less

(Continued on page 120)

Rum Ship Disguised as "Texas Ranger" Fools Coast Guard



This rum ship, cleverly disguised as the freighter "Texas Ranger," was seized in New York with 28,000 cases of rum.

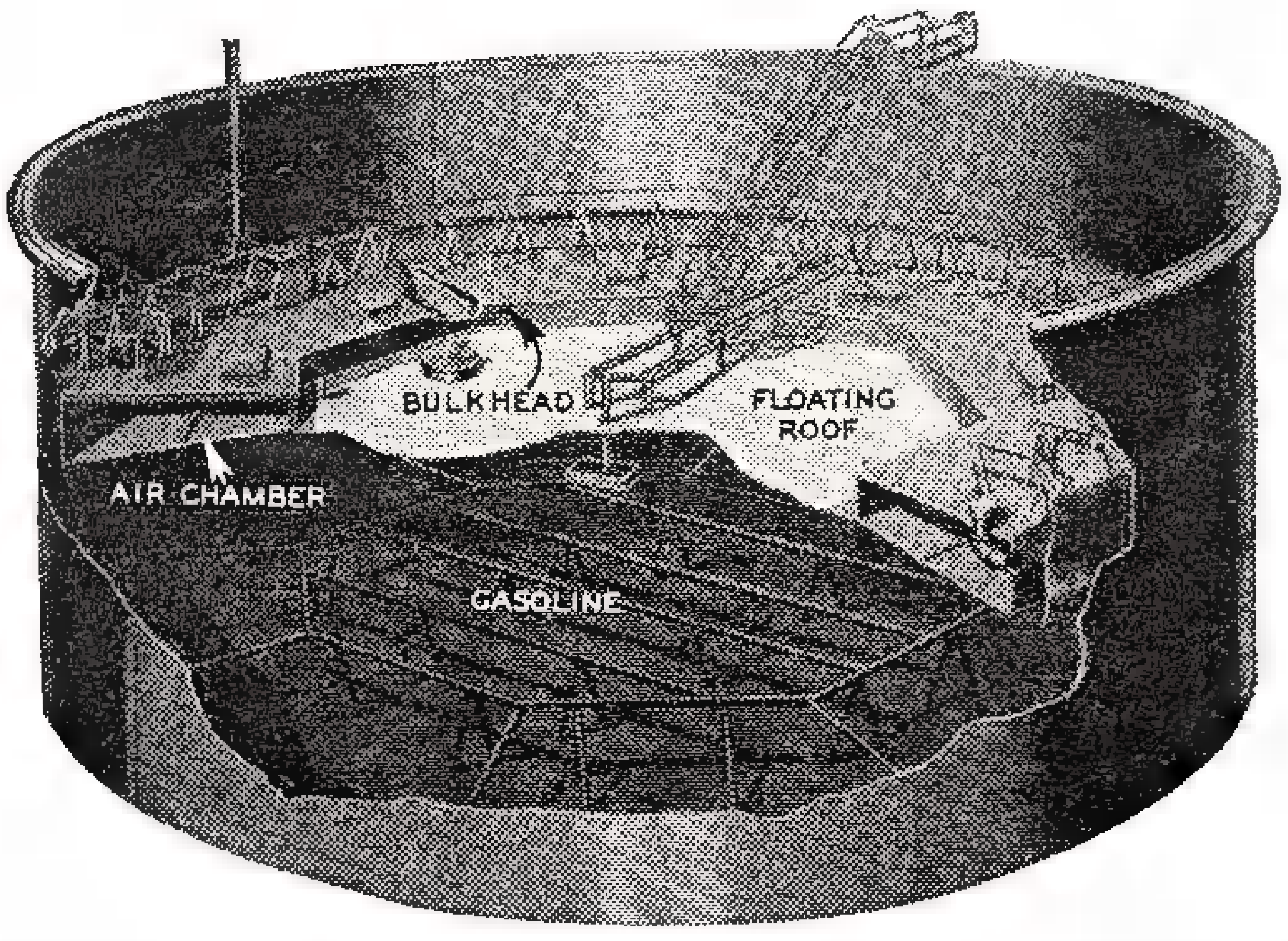
EVEN though New York Harbor Coast Guard men had been tipped off that a big load of Canadian liquor was to be smuggled in, it took the hand of fate to catch the smugglers.

A steamer signalling as the "Texas Ranger," inbound from Galveston, was recognized and passed by all customs inspectors one night.

The next day word from the steamship company that the "Texas Ranger" was still 200 miles from New York puzzled officials.

Customs men, hearing of a freighter grounded on the Hudson river near Haverstraw, hurried up and found the abandoned mystery vessel, with more than a million dollars worth of Canadian whiskey in her hold. The ship had been cleverly disguised to resemble the true "Texas Ranger."

Pontoons Hold Roof of Gas Tank



Floating roof of gasoline storage tank has air chambers separated by bulkheads. Framework at bottom holds roof when tank is empty. Screws press huge piston ring to wall.

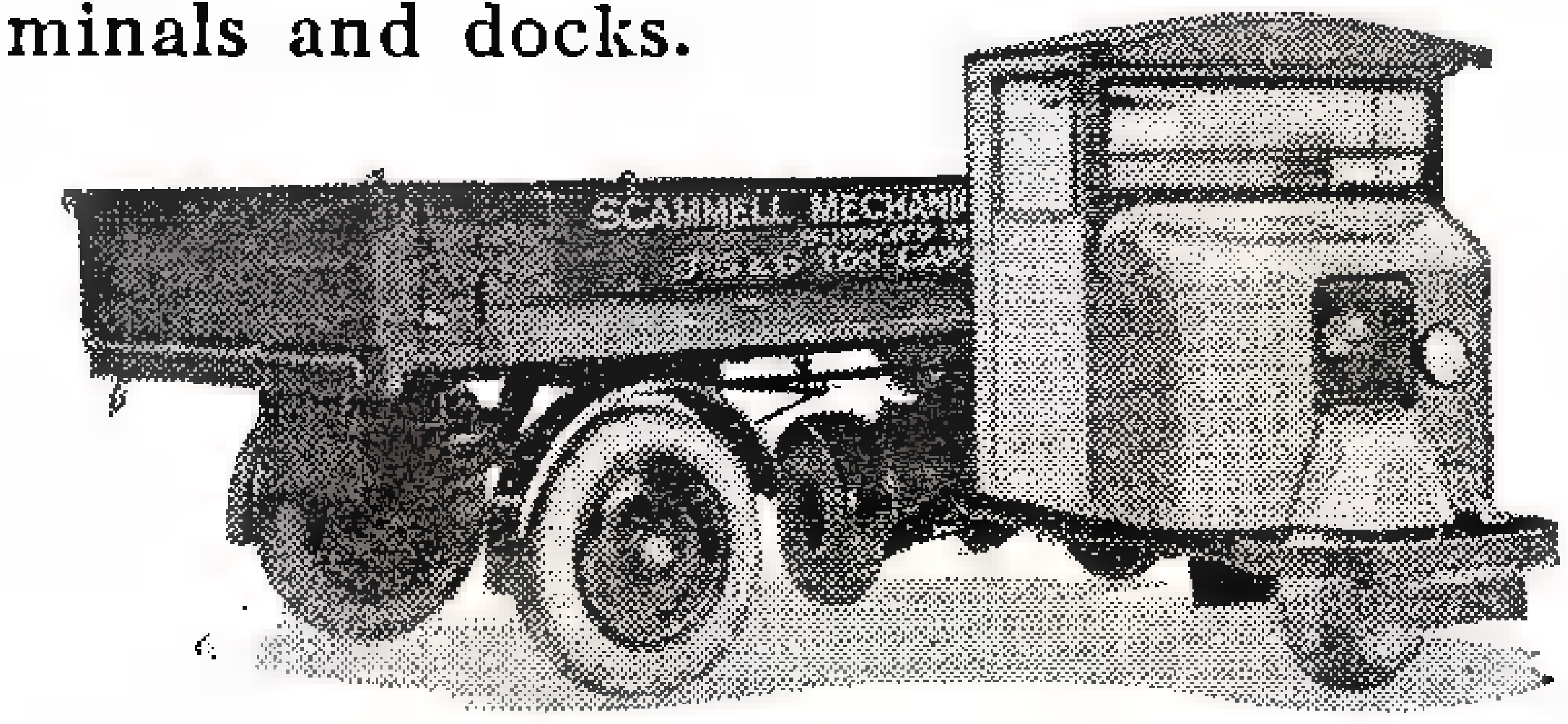
A STEEL roof that floats up or down inside a huge cylinder is now being used by oil companies to protect fuels in storage tanks.

Air spaces built into the circumference buoy up the floating roof at the top of the liquid, much in the manner that pontoons support a floating bridge. A huge steel piston ring fits snugly between the roof and the tank, sealing the tank from rain and preventing the evaporation of gasoline. Adjusting screws evenly spaced around the ring tighten or loosen the seal as needed.

The entire roof moves up or down in the tank as the gasoline level changes. A supporting framework at the bottom of the tank holds the roof when the tank is empty.

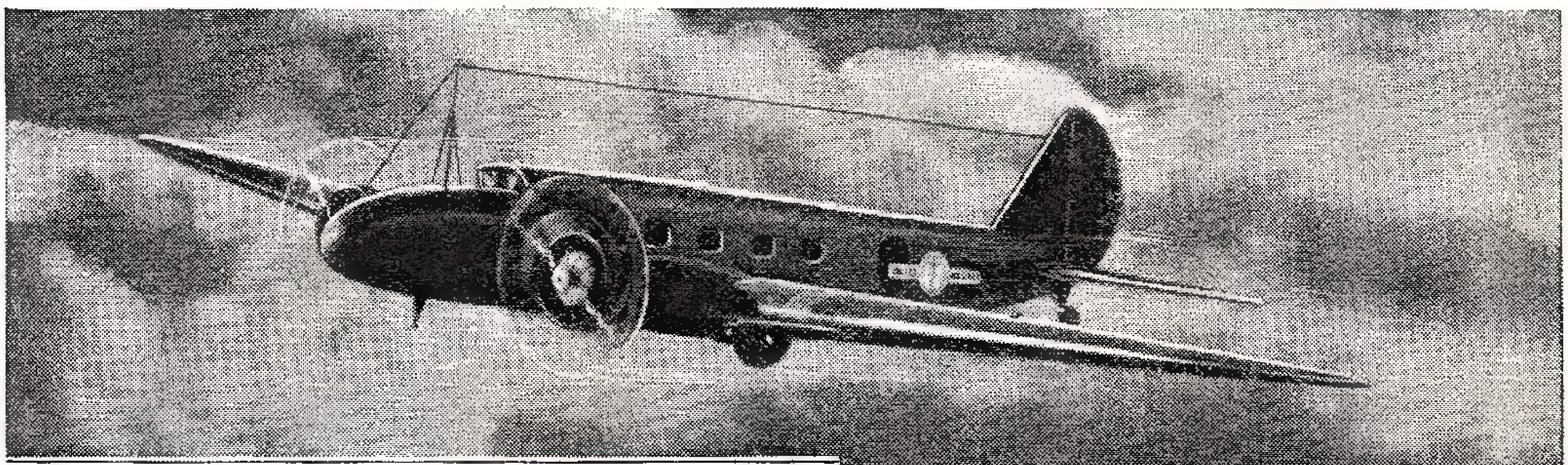
Iron Horse Turns in 15-ft. Circle

A THREE-WHEELED truck intended to pull a number of trailers can turn completely around in a circle scarcely bigger than its own length. This truck, manufactured in England, makes it possible to save much time in getting into crowded terminals and docks.

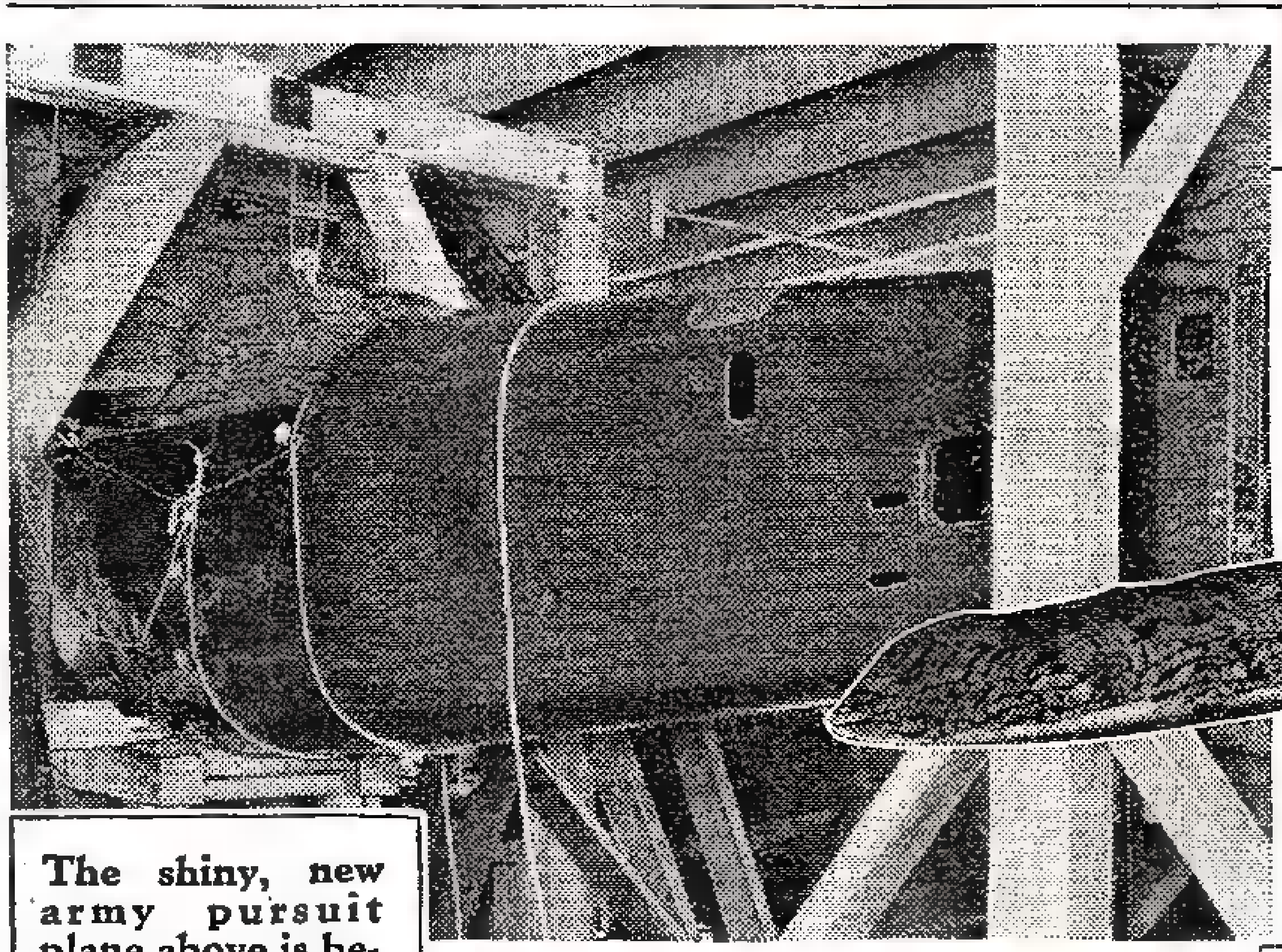


3-wheeled truck for trailers maneuvers in 15-foot circle.

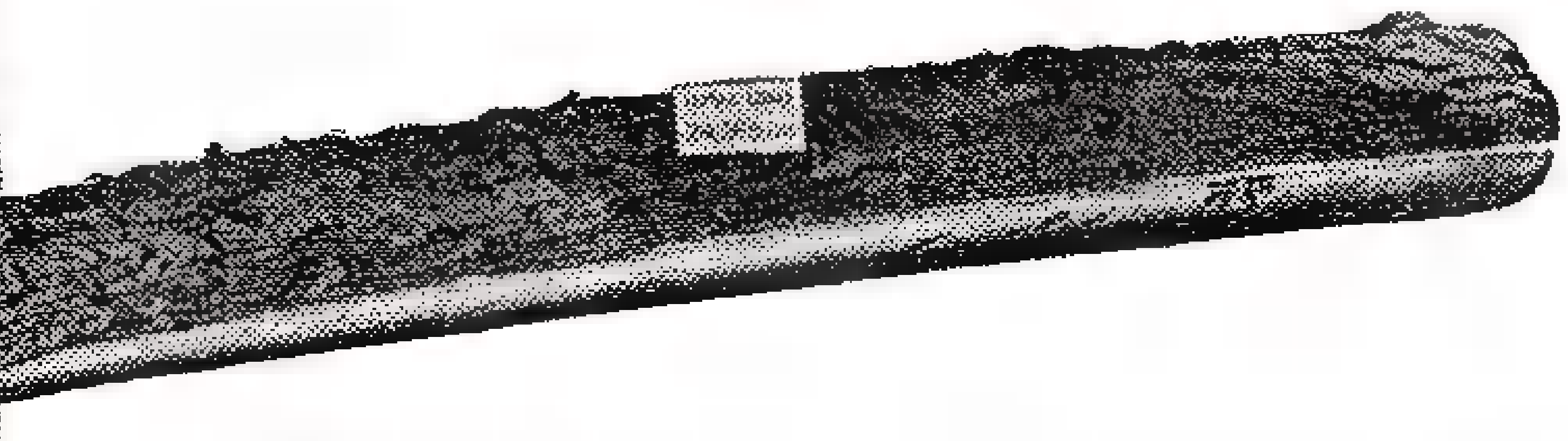
"Air Locomotives" Smashed for SAFETY



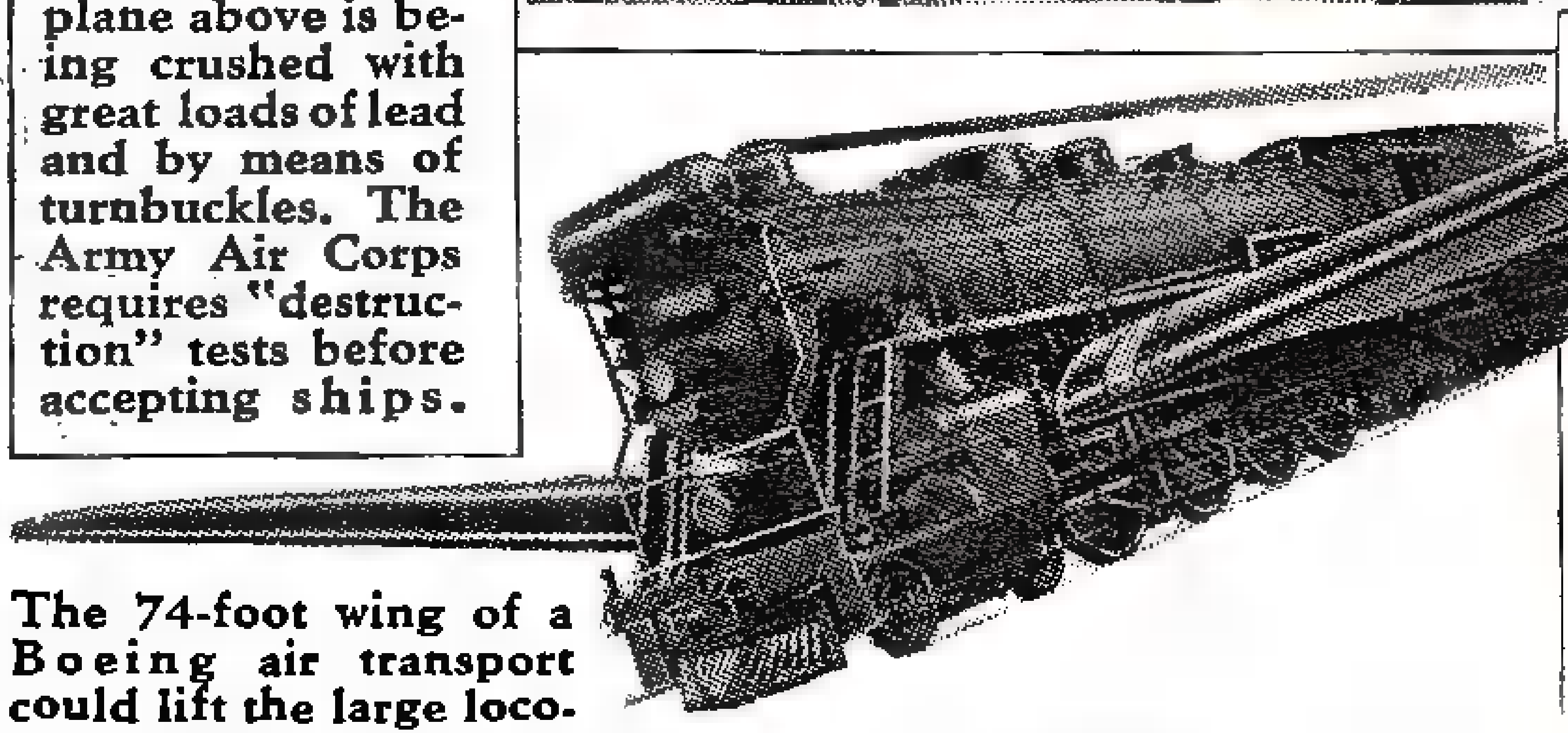
Before this three-mile-a-minute Boeing transport ship took to the air, its mate was smashed to determine the greatest loads and pressure it could stand. Every new type plane must be destroyed before testing in the air.



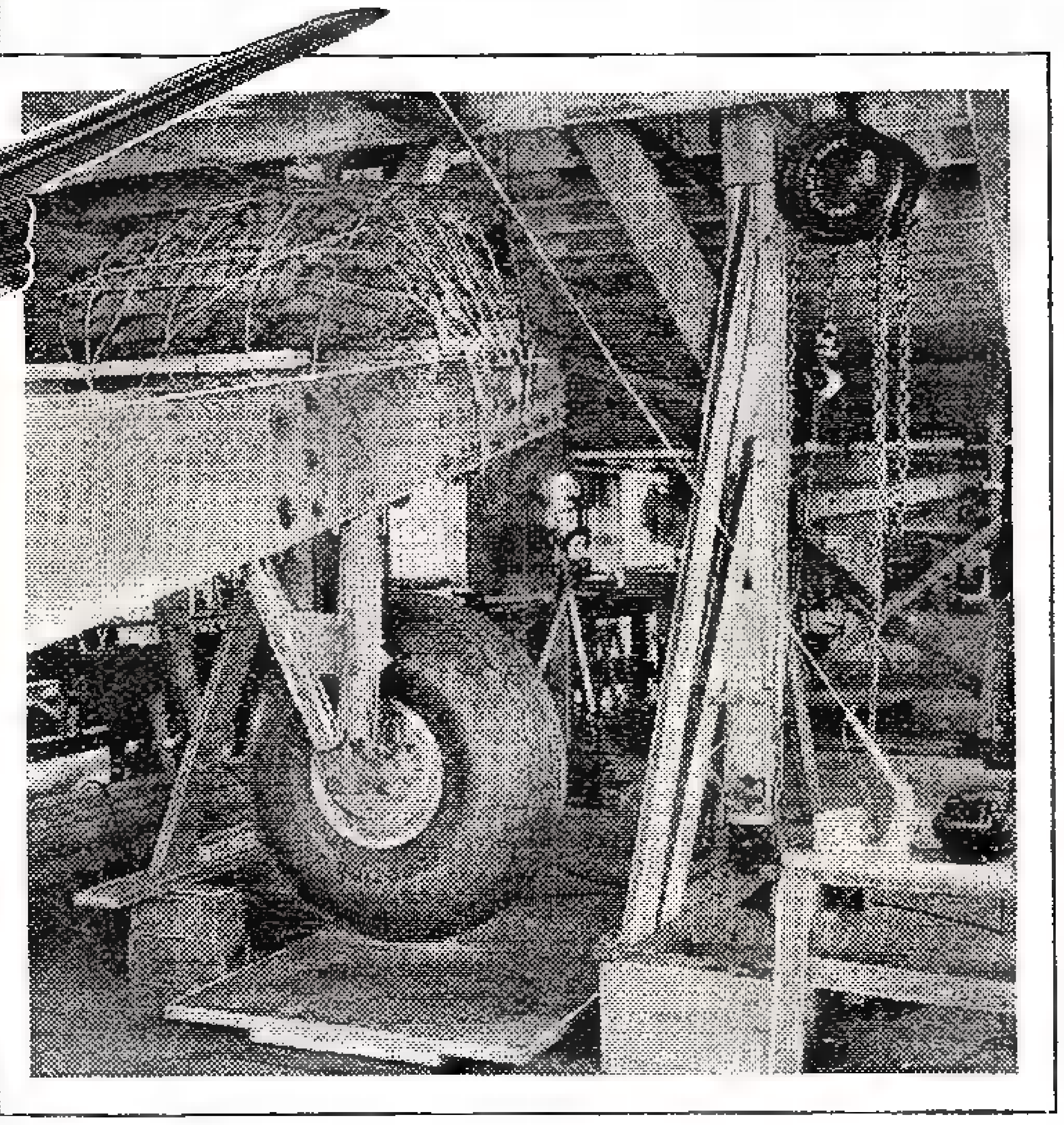
The shiny, new army pursuit plane above is being crushed with great loads of lead and by means of turnbuckles. The Army Air Corps requires "destruction" tests before accepting ships.



A transport's all-metal cantilever wing starting to buckle under 24,000 pounds of lead shot. Note signs of stress on right side of wing in the above photograph.



The 74-foot wing of a Boeing air transport could lift the large locomotive above. The wings stand up under a 36½ ton load, although entire plane weighs only six and one-half tons.



To insure high safety factor the landing gear of a plane is designed to withstand a load of 32¼ tons. Above—Landing gear being given a free drop heavy load test.

GLISTENING and trim-looking, a new type army pursuit plane rolls out of the shops. Expert craftsmen have finished every detail and the ship is ready—not for the air, but for destruction!

Without its wings, the plane is trundled to a test room of the Boeing Airplane company. It is bolted into a wood and steel structure. Workmen load it down with hundreds of pounds of lead shot.

To apply further stress turnbuckles are tightened and more sacks of lead shot added. The ship groans, then begins to buckle slightly. A man peers through a surveyor's level at the plane and makes notes of what he sees. Photographers take pictures at intervals.

Finally there is a sharp crack as something gives way under the tremendous load. "Very good," exclaims the man in charge with a smile of satisfaction.

Every new type plane designed must undergo this "destruction" test before pilots are permitted to test it in the air. The main parts of the ship, the fuselage, wings, landing gear and tail surfaces, are loaded down until something gives way.

These tests determine the safety factor of the new plane. Army pursuit planes, for instance, are given destruction tests to be sure that they can dive at more than 350 miles an hour without shedding their wings.

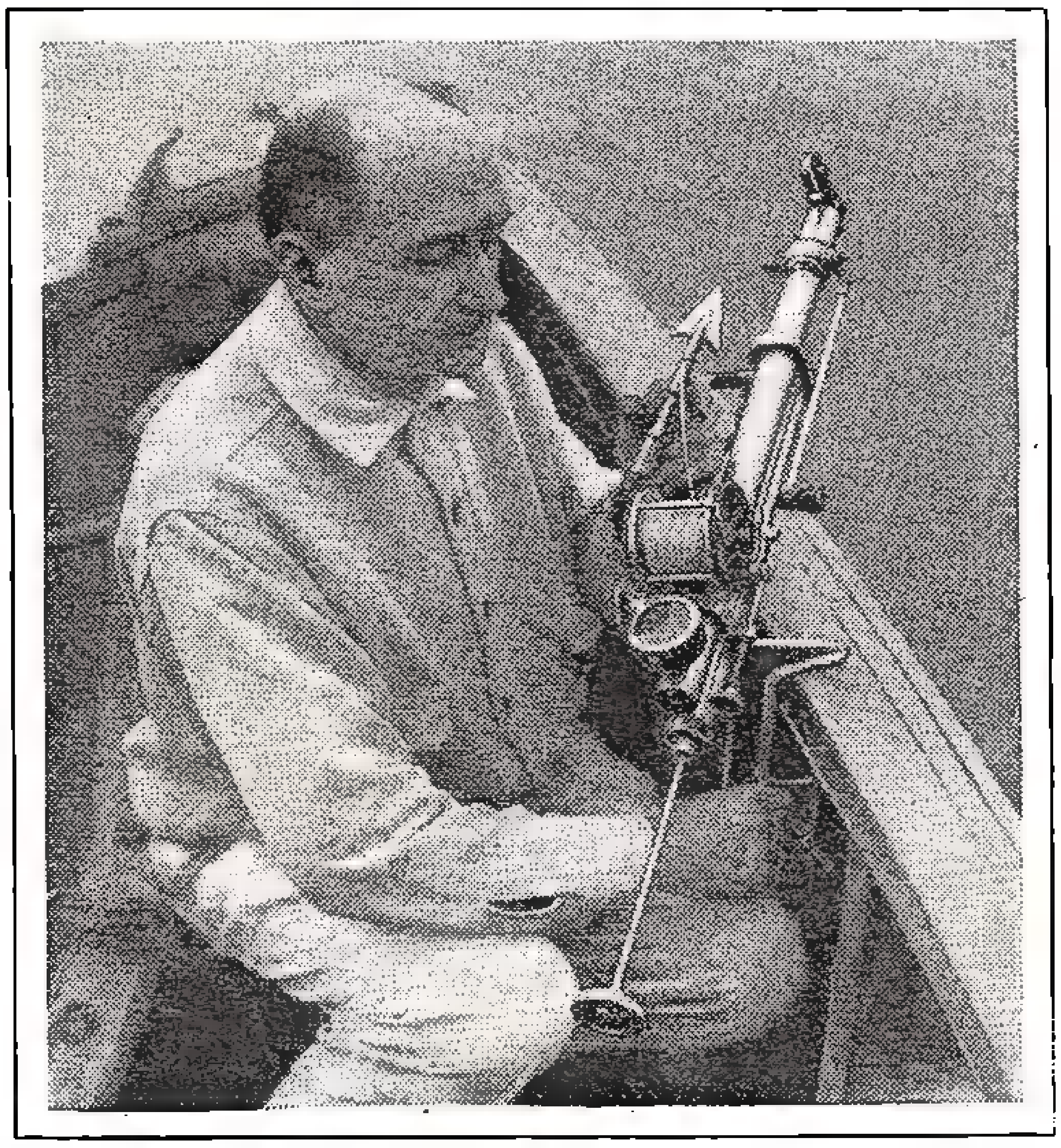
Sword Fishing Gun Has Deadly Accuracy, 200-yd. Range

OUT in California the sport of swordfishing flourishes. A Santa Monica inventor-fisherman, Mr. C. R. Klein, after spending many weary hours in the harpoon pulpits, decided it would be easier to shoot a harpoon—the blade would travel more surely to its mark, and there would be less back breaking labor to the job of bringing in a marlin or broadbill.

So he invented the nifty little air gun shown at the right. It is a compressed air gun which weighs but 8 lbs., and which can be clamped to the gunwale of most any boat. It has a range of 200 yards, the harpoon being a specially constructed piston-like instrument capable of bullet like trajectory.

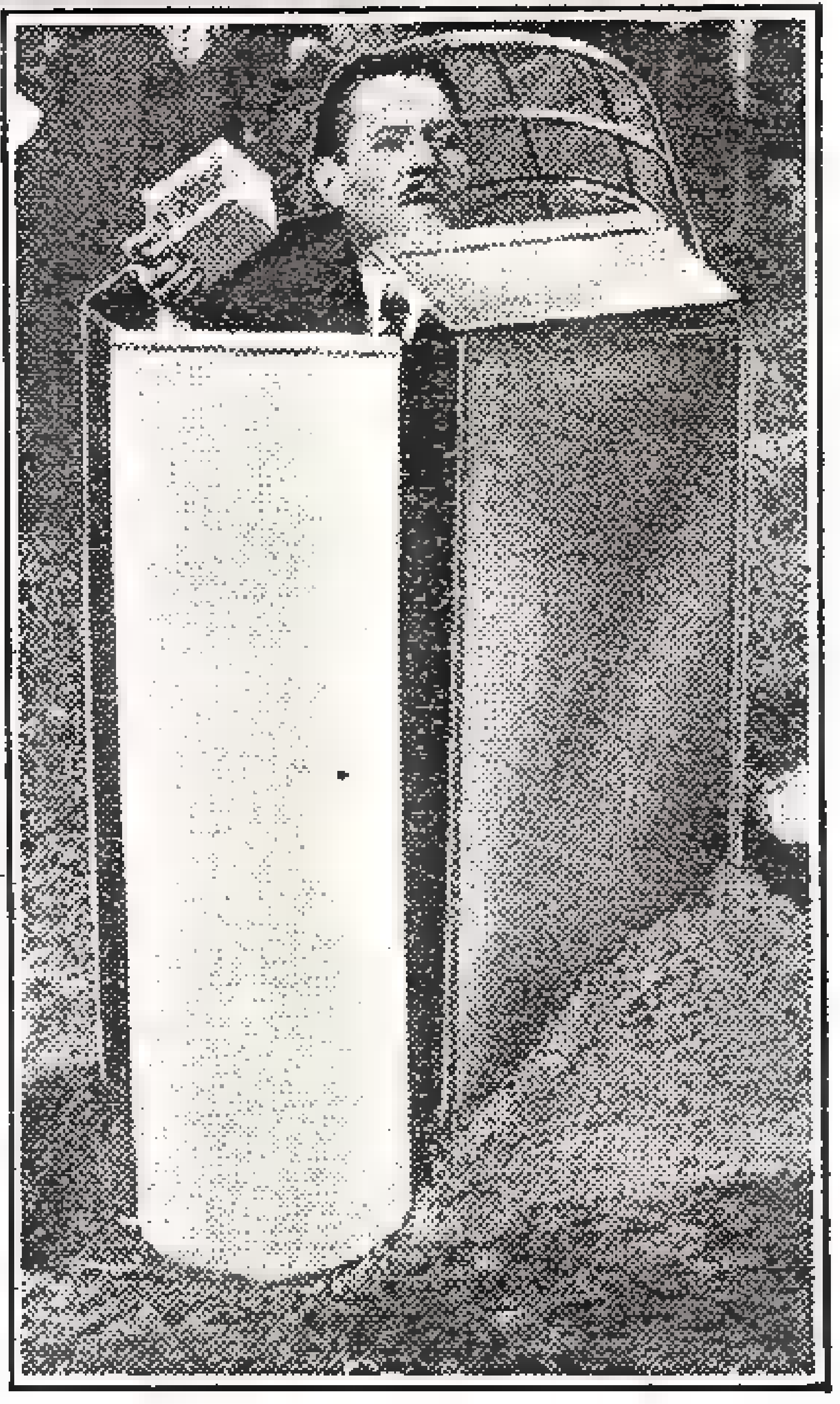
The barrel is 1¼" in diameter, and the air pressure, worked up by hand pump shown at the rear of the gun, is about 100 lbs. to the square inch.

Being almost noiseless, the gun is very effective, and penetrates at great distances with lots of "wallop."



C. R. Klein, of Santa Monica, Cal., with his eight-pound air gun which shoots its harpoon with great accuracy up to 200 yards range. It is fired by a trigger, pumped up by hand.

Fire Proof Plane Design Successful



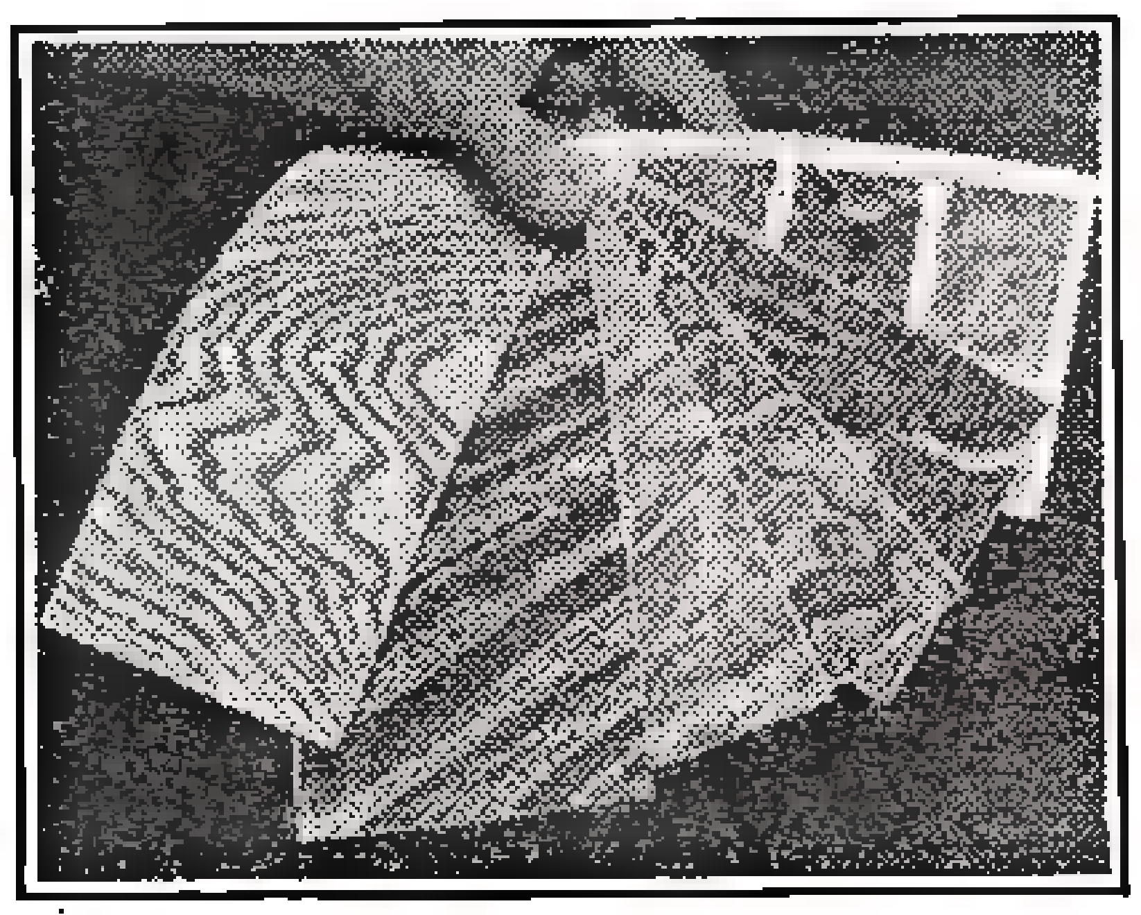
News items recently carried the story of the testing of a new type airplane covering and fuselage design. The tests were held in Belgium, and herewith are the first pictures showing how Major R. Van Rolleghem, noted Belgian airman and inventor, first tested a model in which white mice were unscathed. Right: Full sized model.

NO FIREPROOF airplane, no fireproof mail pouch has yet been built. Recently, in Belgium, Major R. Van Rolleghem, noted foreign aviator, staged an air show of his own in which a fireproof airplane covering resembling mica coated asbestos came through tests triumphantly.

In a miniature airplane, shown at left, two white mice were pilot and observer. Gasoline was thrown about the tiny ship, ignited, and left to burn fiercely. The terrified mice were unharmed. Later, in a full sized model of a plane cockpit—Major Rolleghem sat with a mail pouch while flames seared about him. He, too, was unharmed.

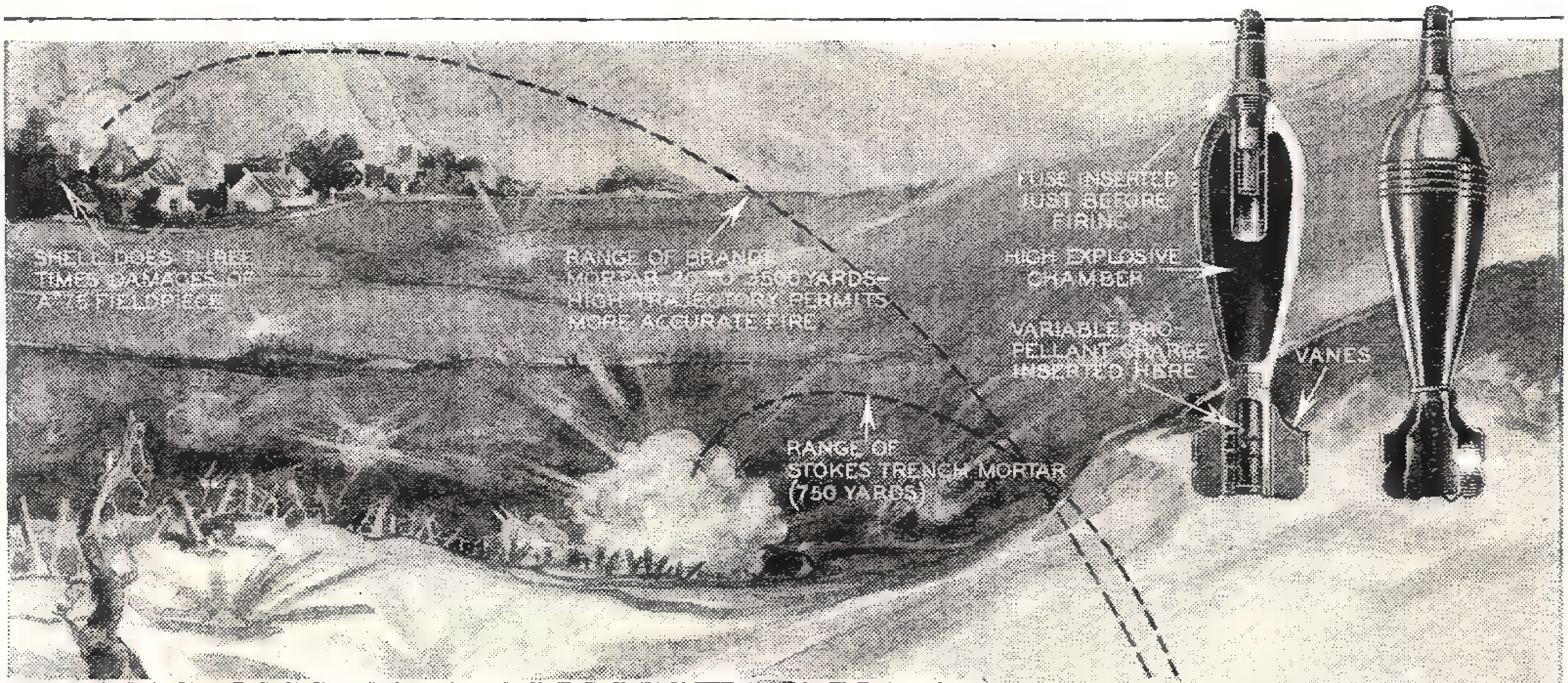
Wood Grain Transfer Paper

THE inexperienced worker can now apply beautiful graining to wood by using transfer papers on which are printed graining designs perfectly imitating the grain of beautiful and expensive woods. The furniture or other object to be grained is first painted with a ground coloring and then is coated with glue size to hold the imprinted design. This is allowed to dry in the usual manner. The paper is placed face downward on a clean table and moderately soaked with water. Then the paper is placed face downward on the wood to be grained, and with a brush the back is rubbed carefully. The paper can be used for two or three applications.



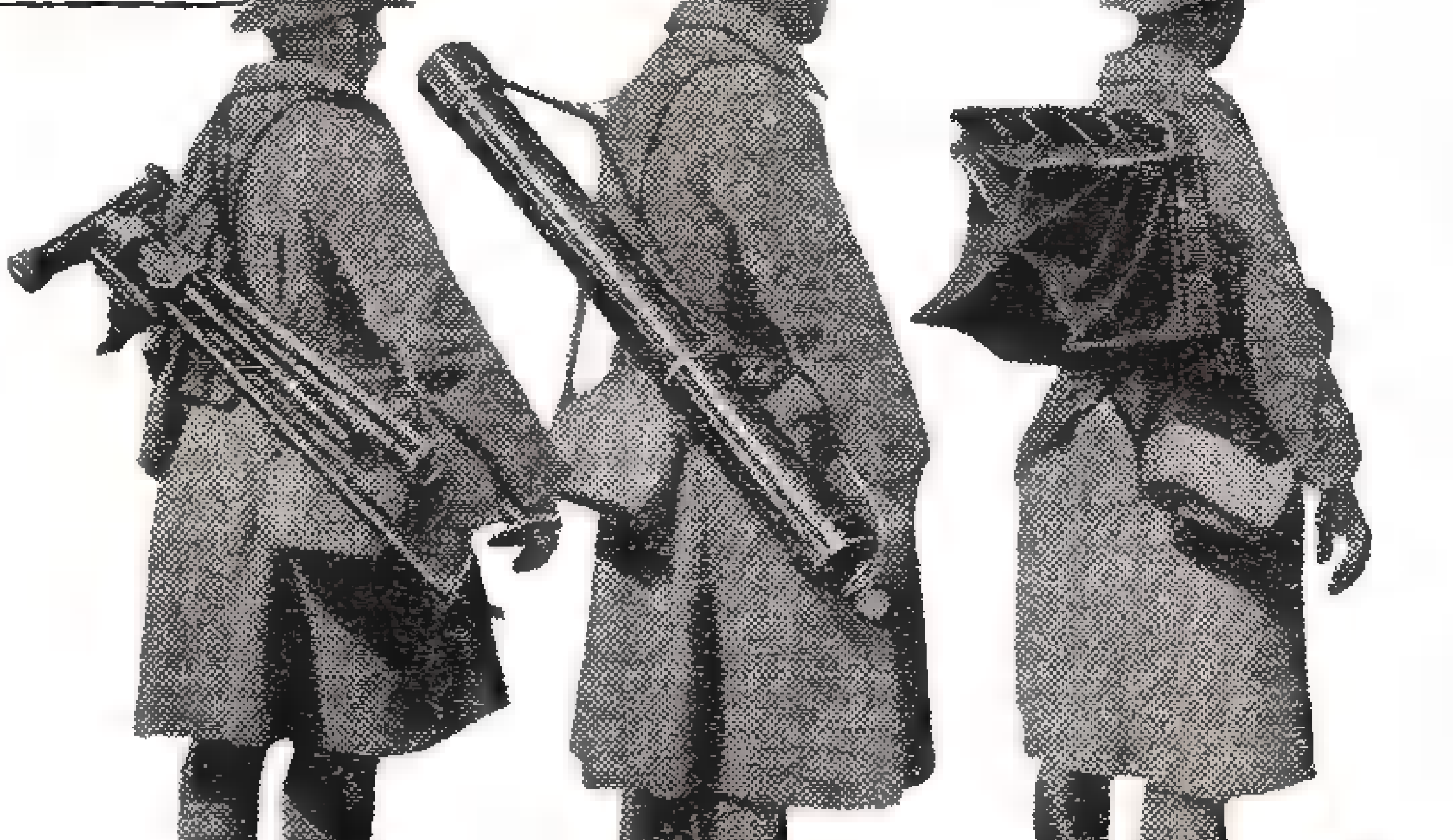
Transfer papers for applying fine grains to coarser woods are available for woodworkers.

Infantry Carries New Deadly Artillery


SHELL DOES THREE TIMES DAMAGES OF A 75 FIELDPIECE
RANGE OF BRANDT MORTAR 20 TO 3500 YARDS— HIGH TRAJECTORY PERMITS MORE ACCURATE FIRE
RANGE OF STOKES TRENCH MORTAR (750 YARDS)
FUSE INSERTED JUST BEFORE FIRING
HIGH EXPLOSIVE CHAMBER
VARIABLE PROPELLANT CHARGE INSERTED HERE
VANES

The greater accuracy and range of the new Brandt mortar compared to the old Stokes trench gun is depicted above. Inset shows interior and exterior of seven-pound shell.

The new Brandt infantry mortar is shown above in action. The shells, dropped into the muzzle, fire automatically.



Three men can carry the new Brandt mortar anywhere the infantry goes, as shown above. The man at left is carrying the tripod, in center the tube, and at right the base-plate.

INFANTRY equipped with its own deadly and accurate artillery has always been the dream of military strategists.

During the World War infantry often suffered severe losses because it could not obtain artillery fire quickly to wipe out machine gun nests and strongly fortified positions. Artillery fire was directed independently by higher command.

The U. S. Army has met the need by developing a new weapon, the 81 mm. Brandt mortar, which is capable of more rapid and accurate fire than the famous French .75 field piece and the old 3" Stokes trench mortar, developed during the war.

Fires 30 Shells a Minute

The Stokes mortar had a range of only 750 yards and its accuracy was bad. The new Brandt mortar has a range of 20 to 3,500 yards. It can be carried in three light loads, the tube, base-plate and tripod, and is easily transported over ground inaccessible to any mounted artillery piece.

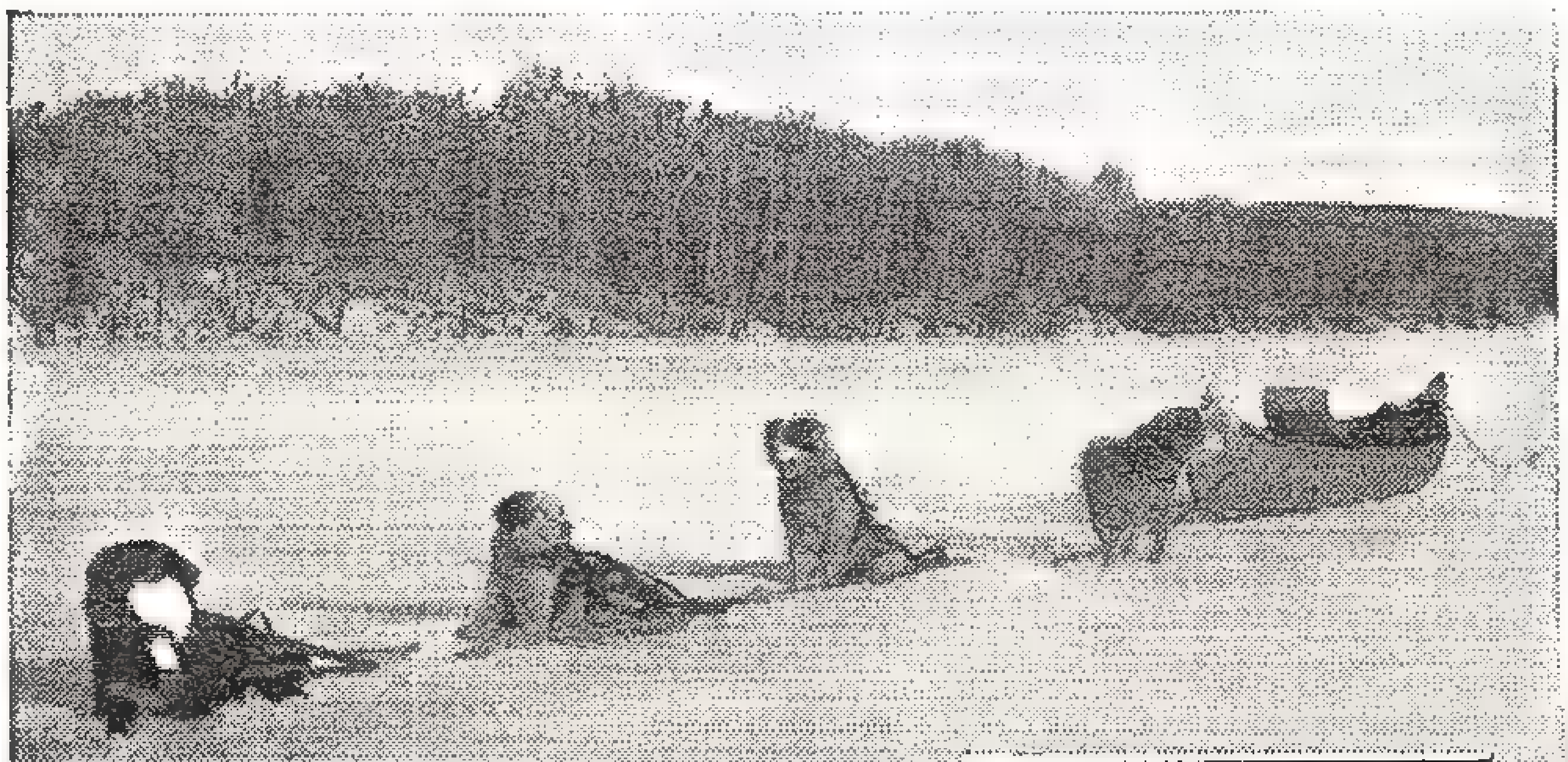
The mortar tube is not rifled, accuracy being obtained by a streamlined shell equipped with vanes which open as soon as the projectile leaves the gun. The shell weighs only seven pounds. Instantaneous fuses are provided, as well as time fuses for penetration when shelling machine gun shelters and dugouts.

The Brandt mortar can fire 30 shells a minute and up to two miles is more accurate than artillery.

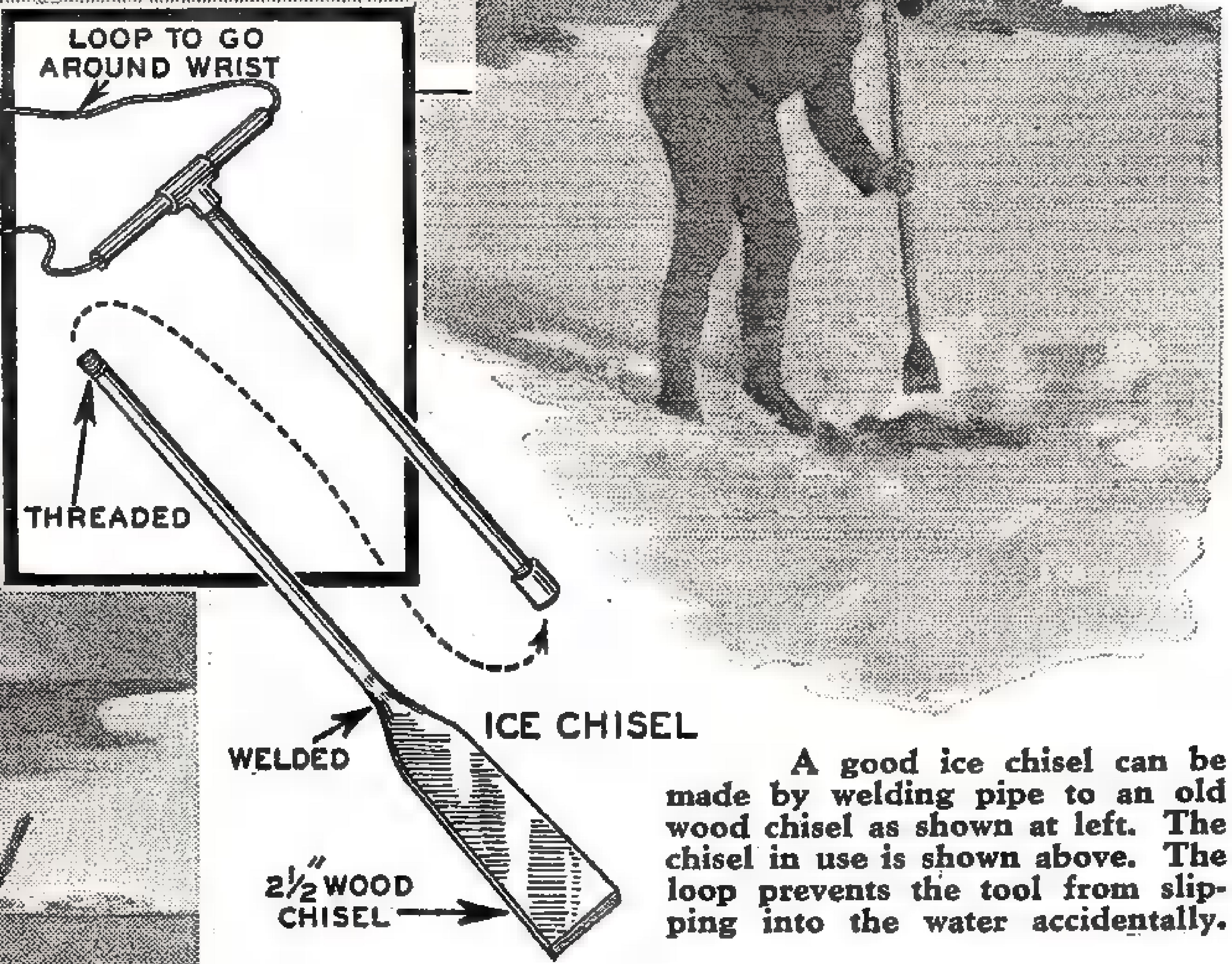
Expert TIPS on WINTER

by Robert Page Lincoln

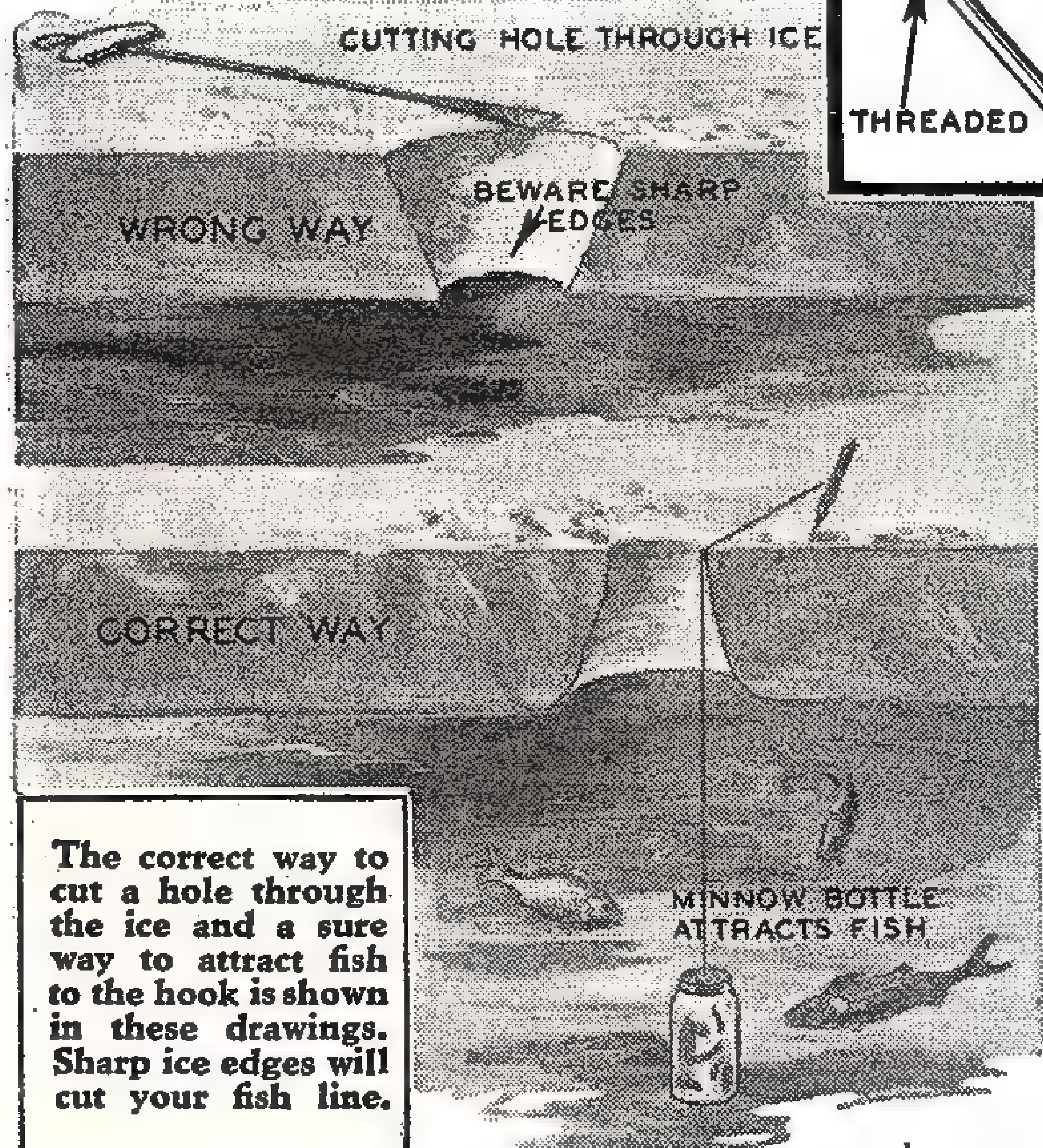
Winter fishing is great sport if you follow these expert hints. You can increase your catch with the home-made equipment described here.



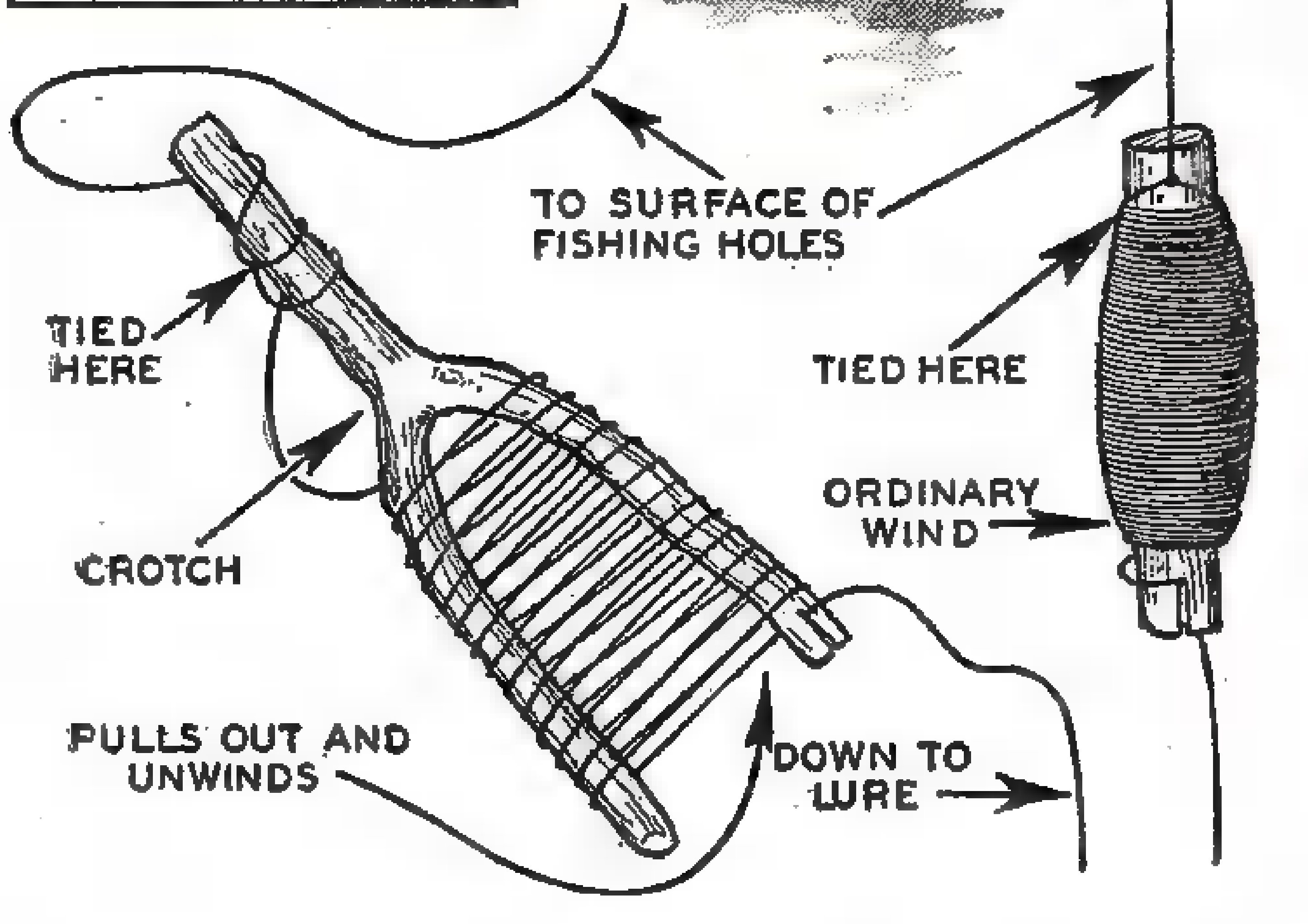
Through the northern ice of Canada Robert Page Lincoln's huskies drag a canoe loaded with provisions. The author has covered the hunting grounds of the continent.


LOOP TO GO AROUND WRIST
THREADED
WELDED
ICE CHISEL
2½" WOOD CHISEL

A good ice chisel can be made by welding pipe to an old wood chisel as shown at left. The chisel in use is shown above. The loop prevents the tool from slipping into the water accidentally.


CUTTING HOLE THROUGH ICE
WRONG WAY
BEWARE SHARP EDGES
CORRECT WAY
MINNOW BOTTLE ATTRACTS FISH

The correct way to cut a hole through the ice and a sure way to attract fish to the hook is shown in these drawings. Sharp ice edges will cut your fish line.


TIED HERE
TO SURFACE OF FISHING HOLES
TIED HERE
CROTCH
ORDINARY WIND
PULLS OUT AND UNWINDS
DOWN TO LURE

A fish line crotch made from a tree branch will permit a fish to wear itself out as it runs away with the line. Another method, a simple winding stick, is shown at right.

CUTTING through the ice and dropping a baited hook down to the finny inhabitants of the lakes forms a wintry pastime that is indulged in through the whole length and breadth of the snow country.

That it can be made a very successful pastime, goes without saying. But to have the best results one must know thoroughly the equipment used and how to use it.

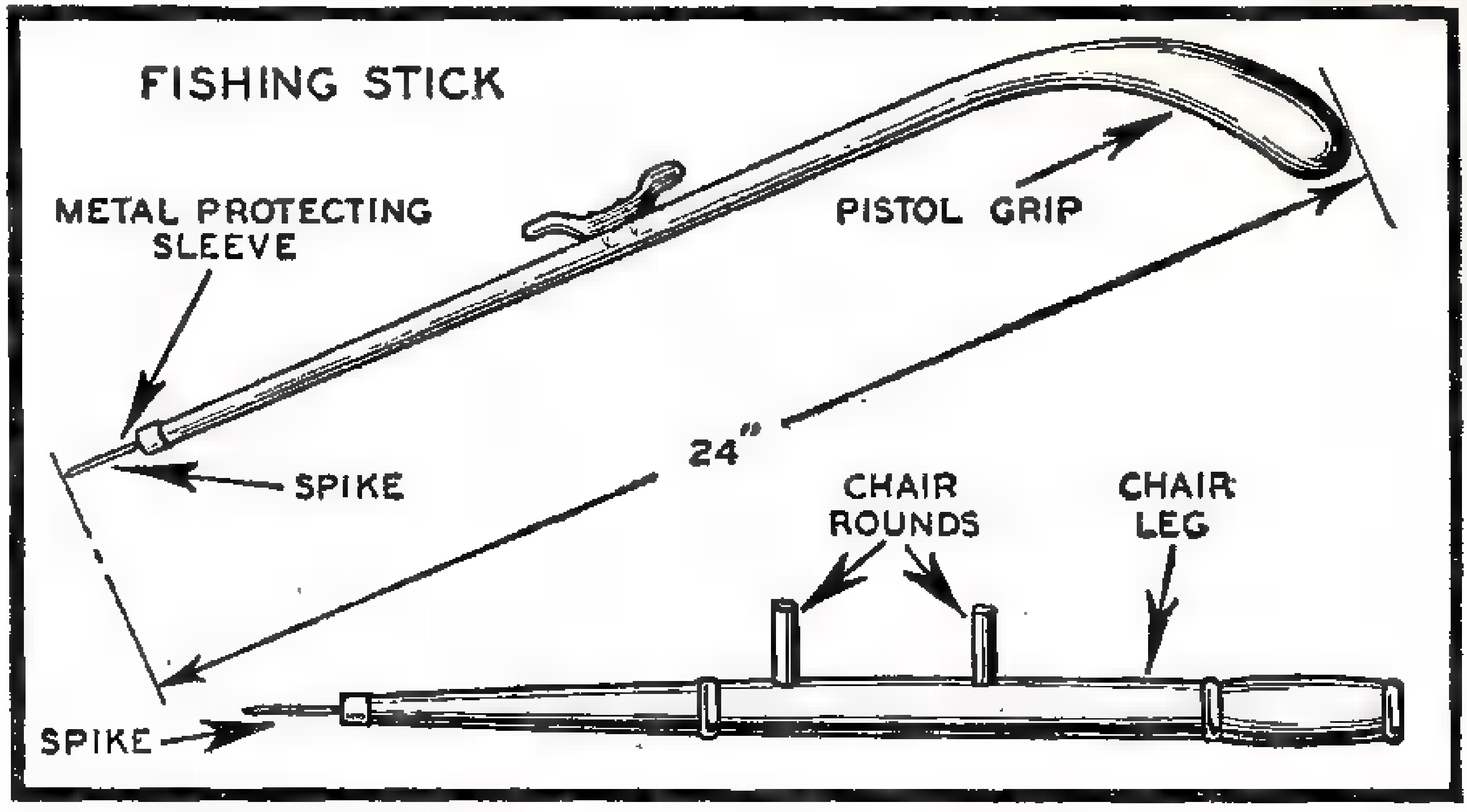
Making Ice Chisel and Fishing Stick

An ice chisel is a real necessity. Some use a common, everyday axe for the purpose, but it is unsafe and far from practical. You can make a good ice chisel by welding an old worn-out two or two and one half inch wood chisel to the end of a pipe one and one half inches in diameter. The total length of this pipe handle is four and one half feet.

To aid in transporting this chisel, it can come in two pieces, jointed in the middle with a threaded end and coupling. To give the proper heft to the pipe section connected to the chisel, pour that end full of lead. Thus every blow driven into the ice will have weight behind it.

To the top of the ice chisel, turn on a T-connection, which will give you a grip, and make it easier to drive into the ice

FISHING Through the ICE



Two excellent fishing sticks, easy to make, are shown above. Line is wound around the projecting pieces of wood. Spike is jabbed into the ice for leverage against pull of fish after it is "hooked."

Above at right is the chair leg fishing stick in use and at left the fisherman is holding the pistol grip type. Photo at the right is a closeup of the ice fisherman's tools, a home-made ice chisel and the chair leg fish stick. How to make and use these simple, but efficient, fishing tools is described in accompanying article.

without hurting the hand. Through the hole of the T-connection, insert a loop of clothes-line, for a turn around the hand or wrist, which will prevent loss of the chisel should it slip from the hand.

The fishing stick is a most desirable item in the ice fisherman's equipment. A very excellent type can be made with a handle that is shaped like a pistol grip. The stick has a notched wooden piece on its side on which to wind the line.

Correct Line and Minnow to Use

A very simple fishing stick, devised by the writer, can be made from the leg of an old chair, leaving two of the rounds intact, cut off about two inches. On these round-ends the surplus line is wound. The turned part of the upper end of this fishing stick makes a good handle.

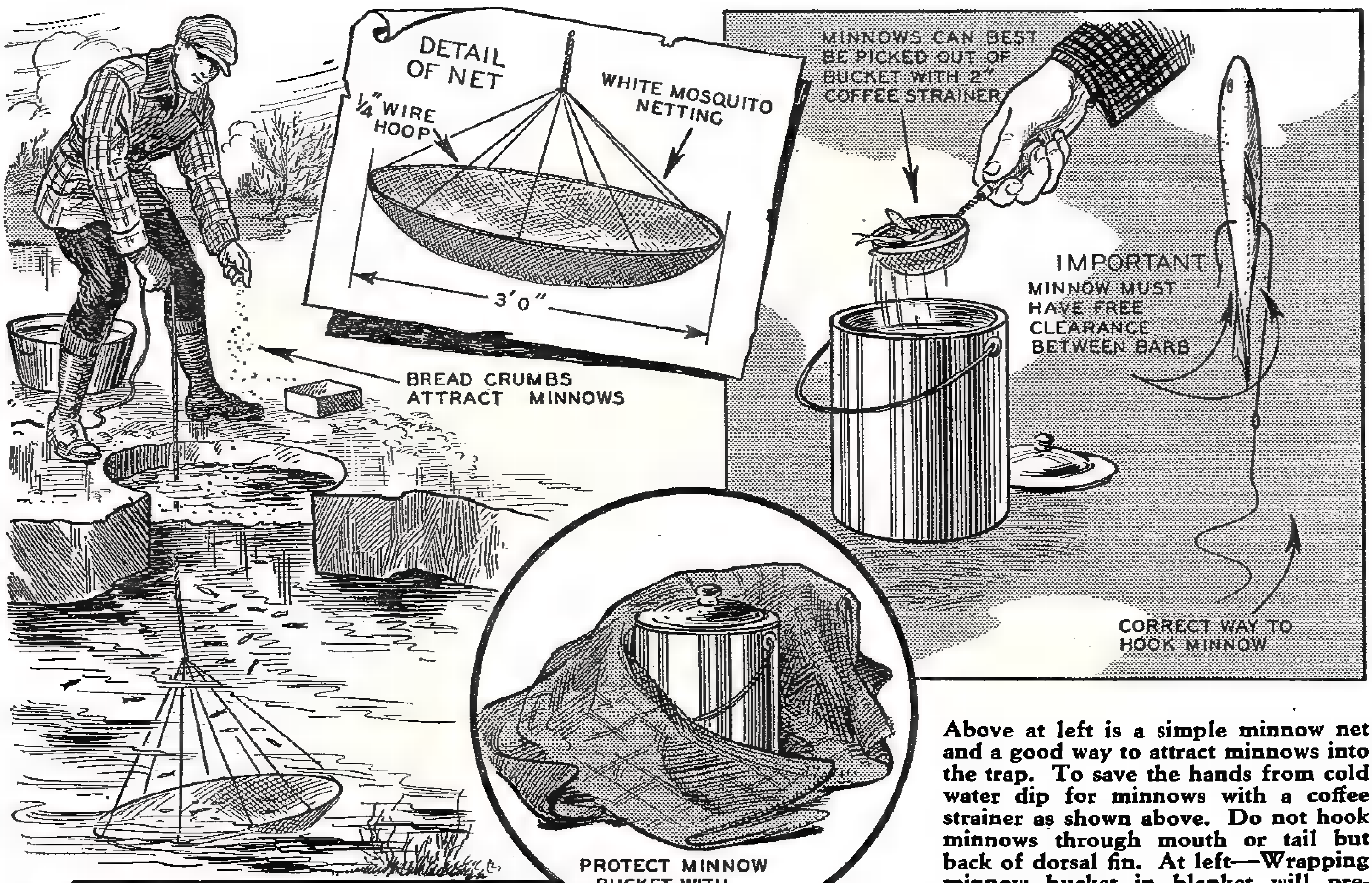
Fishing sticks may be made from cedar, which provides a light item. To make the "spike" end of the fishing stick, to be poked in the ice or snow at the edge of the fishing hole, drill a hole part way into the end of the stick, drive in a ten penny nail or a spike and then cut off the nail and file sharp. A worn out icepick point makes an unexcelled spike for a fishing stick. A new one costs only five cents.

For crappie, sunfish, perch and similar small fish use a nine pound test, black, tournament line, even lighter than that if desired. For pike and pickerel fishing and heavier fish use eighteen pound test hard-braided line. Use the quill-type of sensitive float, for a cork is often deceiving and is not overly reliable.

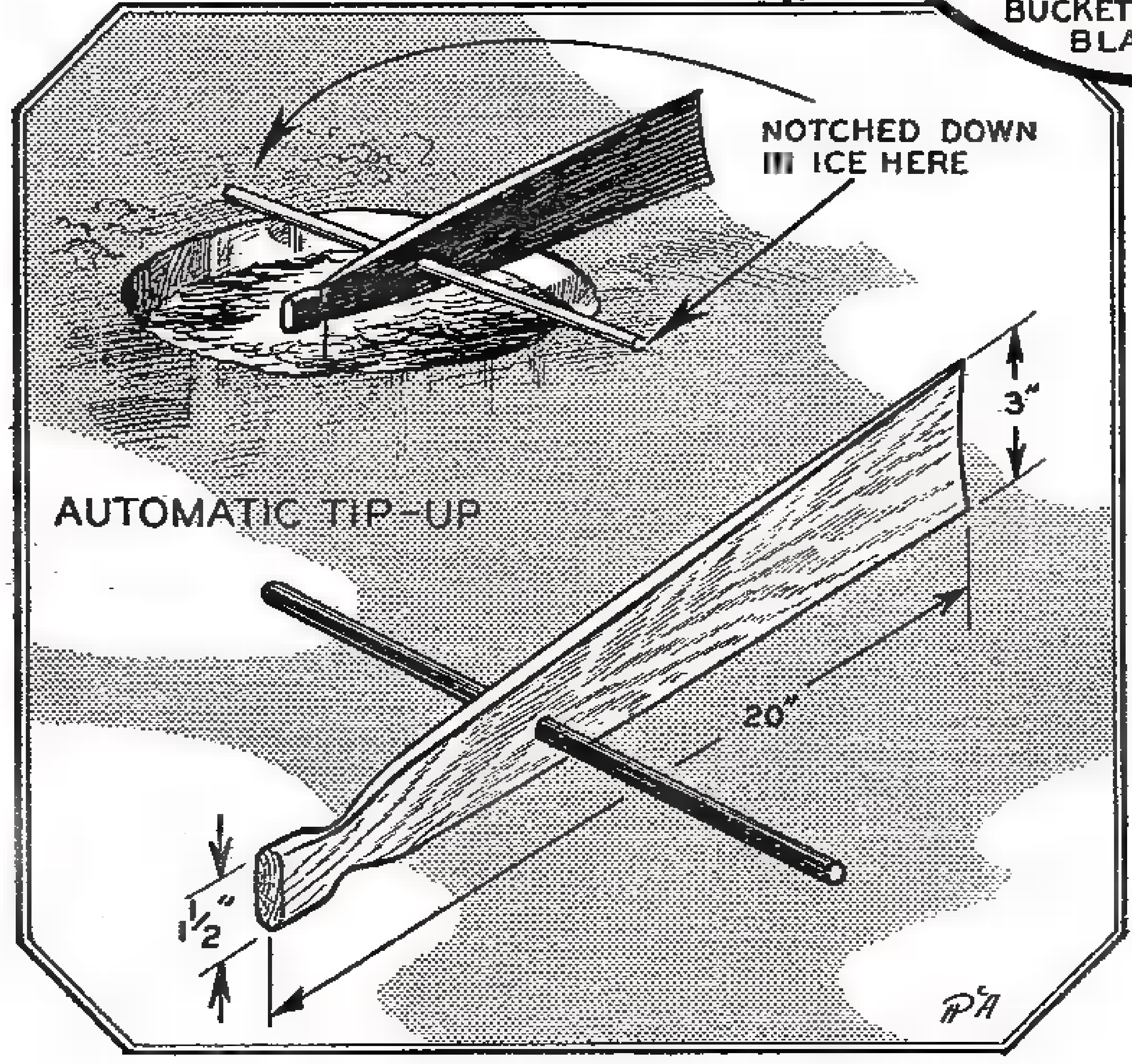
Minnows ranging one and one half to two inches in length are best for crappies, sunfish, perch, and other small fish. Minnows ranging three to eight and ten inches are best for wall-eyed pike, great northern pike, pickerel.

Hook the minnow for all manner of ice fishing through the skin and some of the flesh just back of the dorsal (back) fin, but never so deep that the spine is touched as that will kill the minnow. Never hook the minnow as is commonly done in the stom-

Here's an Automatic Tip-up and Other Good Kinks for Ice Fishermen


DETAIL OF NET
¼" WIRE HOOP
WHITE MOSQUITO NETTING
3'0"
BREAD CRUMBS ATTRACT MINNOWS
MINNOWS CAN BEST BE PICKED OUT OF BUCKET WITH 2" COFFEE STRAINER
IMPORTANT
MINNOW MUST HAVE FREE CLEARANCE BETWEEN BARB
CORRECT WAY TO HOOK MINNOW
PROTECT MINNOW BUCKET WITH BLANKET

Above at left is a simple minnow net and a good way to attract minnows into the trap. To save the hands from cold water dip for minnows with a coffee strainer as shown above. Do not hook minnows through mouth or tail but back of dorsal fin. At left—Wrapping minnow bucket in blanket will prevent water from freezing.


NOTCHED DOWN IN ICE HERE
AUTOMATIC TIP-UP
3"
20"
1½"
PA

The automatic tip-up above is easily made. The rear end will swing into the air when a fish is caught, giving a signal to the fisherman who can be handling other lines.

ach, in the mouth or in the tail. Hooked back of the dorsal fine the minnow can swim about, if the line is not too heavy.

Minnows are often hard to locate in the winter, but they can be obtained by going to some pool on a stream containing chubs and shiners. Make a hoop from a wire a fourth inch thick and three feet in diameter. To this sew on white mosquito netting, the centre bellying down. Tie strings at several balancing points on this hoop, these tie strings meeting and connecting to the main cord. The main cord is held in the hand.

Cut a hole in the ice larger than the net, clear the hole of ice-scum, let the net down and then scatter cracker crumbs down over the net. Hundreds of minnows will be attracted into the net. Minnows can be kept indefinitely in a common wooden tub into which some water is permitted to dribble, allowing for an equal amount to escape. This provides properly aerated water. Feed minnows with a paste made from thinly ground beef liver, mixed with a little flour. Feed at least once a day.

Fish Will Break Taut Line

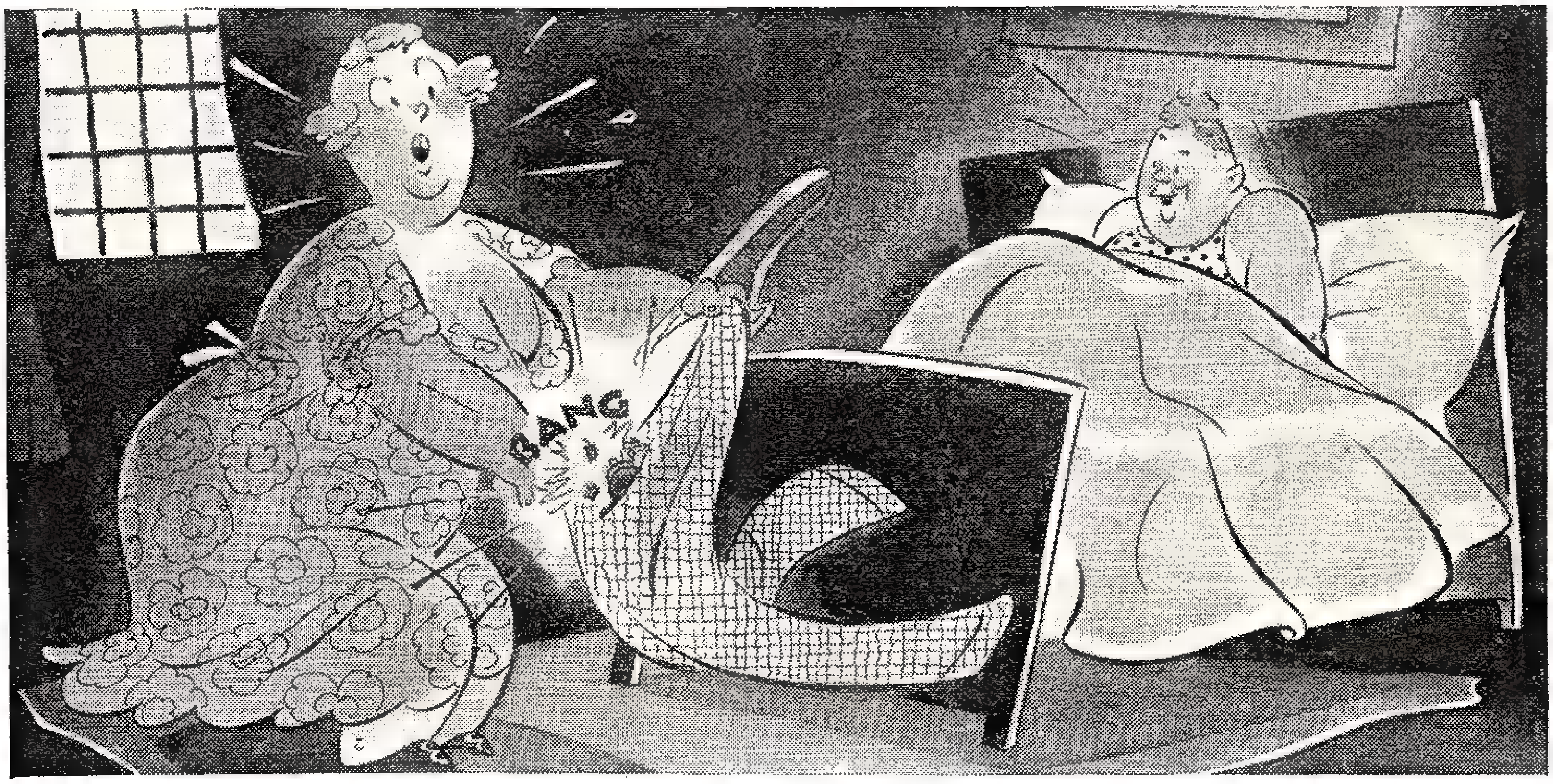
Set lines are not permitted in all states, but where such is the case the method illustrated may be employed. It is merely a cross-piece laid across the fishing hole to which the "announcer" or "tip-up" is slipped on through a hole in its center. The line is tied at the tapering end. The wider end is trimmed down thin. When a fish seizes the lure this announcer flies up and the line is ready to be drawn up with its catch.

It is well-known in pickerel fishing that if the fish is given a taut line to pull on, it may break the line. One of the drawings shows a method of releasing line a little at a time with a crotch. By the time the fish has removed all the line, it will be exhausted.

The device is made from the wooden crotch of a tree, tying the line firmly to the handle and then stringing the line back and forth over the crotch, finally seating the line in a slit in one of the arms of the crotch. The fish seizes the lure, makes a

(Continued on page 131)

Pocketbook Firecracker Alarm Catches Wife



Here's the latest engineering triumph for hen-pecked husbands—a device which fits into the pocketbook, and contains a paper firecracker which goes off with the noise of a pistol whenever anyone attempts to remove the money.

A PAPER firecracker device which goes off with the noise of a pistol every time the pocketbook containing it is opened was Exhibit No. 1 at a divorce suit instituted by C. J. O'Brien, wealthy contractor of Baltimore.

O'Brien told Judge O'Dunne how he had suspected his wife of taking loose change from his pockets each night, and how he caught her by rigging up the firecracker device.

Cobbling Bill Paid in Gold Dust

Ed Lewis pays for repair work on his shoes with gold dust measured out on this crude, but accurate, yardstick balance.

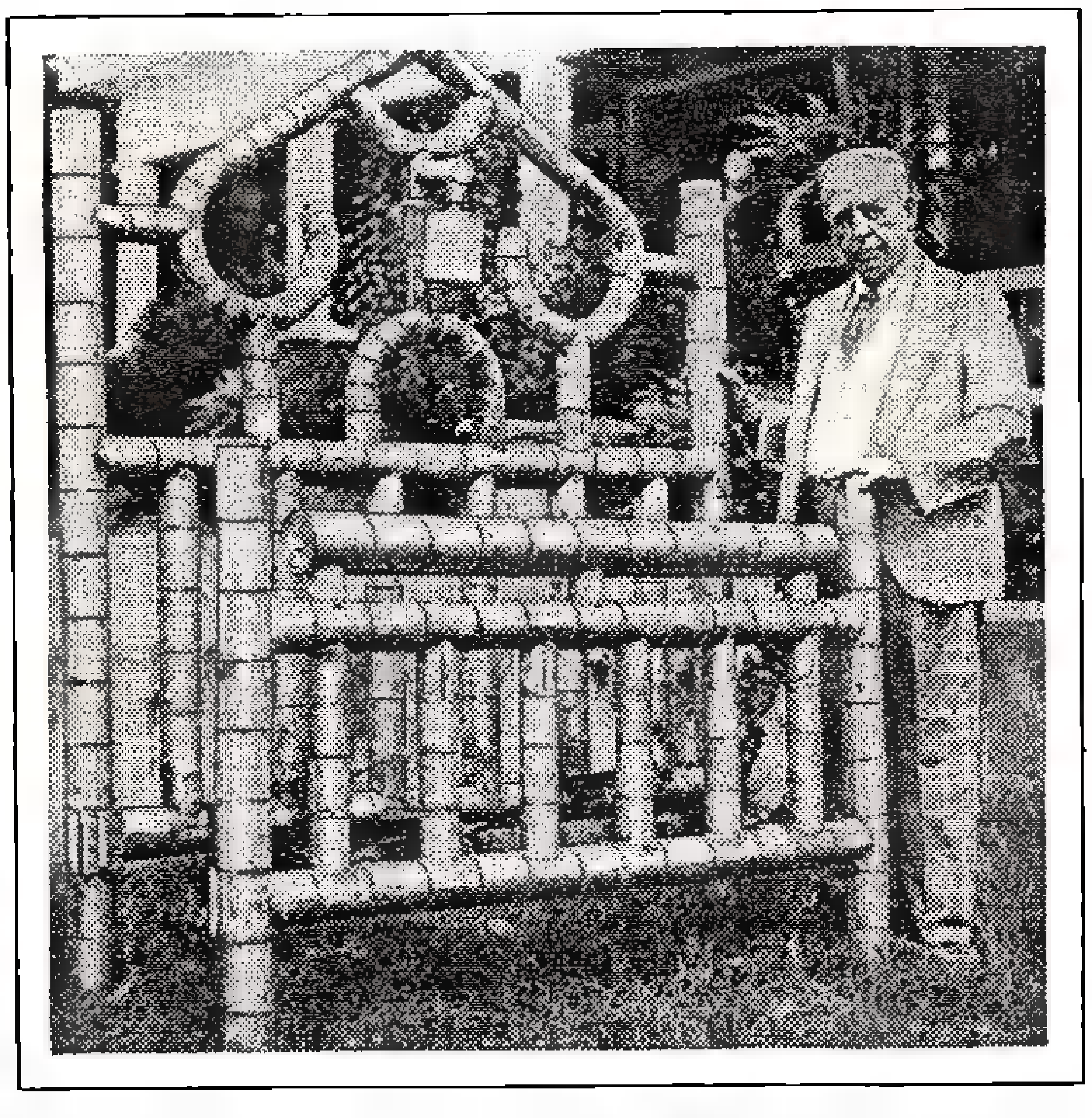
A YARDSTICK, a knife, and a dime were all Ed Lewis, gold miner of Grant's Pass, Oregon, needed to pay his shoe repair bill in gold dust during the banking holiday.

Mike Byrd, the cobbler, set a dime weighing .1 ounce on one end of a yardstick balanced on a knife, and poured gold dust on the other end until the stick balanced. His guess of $1.75 was not over two cents off.

Perfect Bed Built of Tin Cans

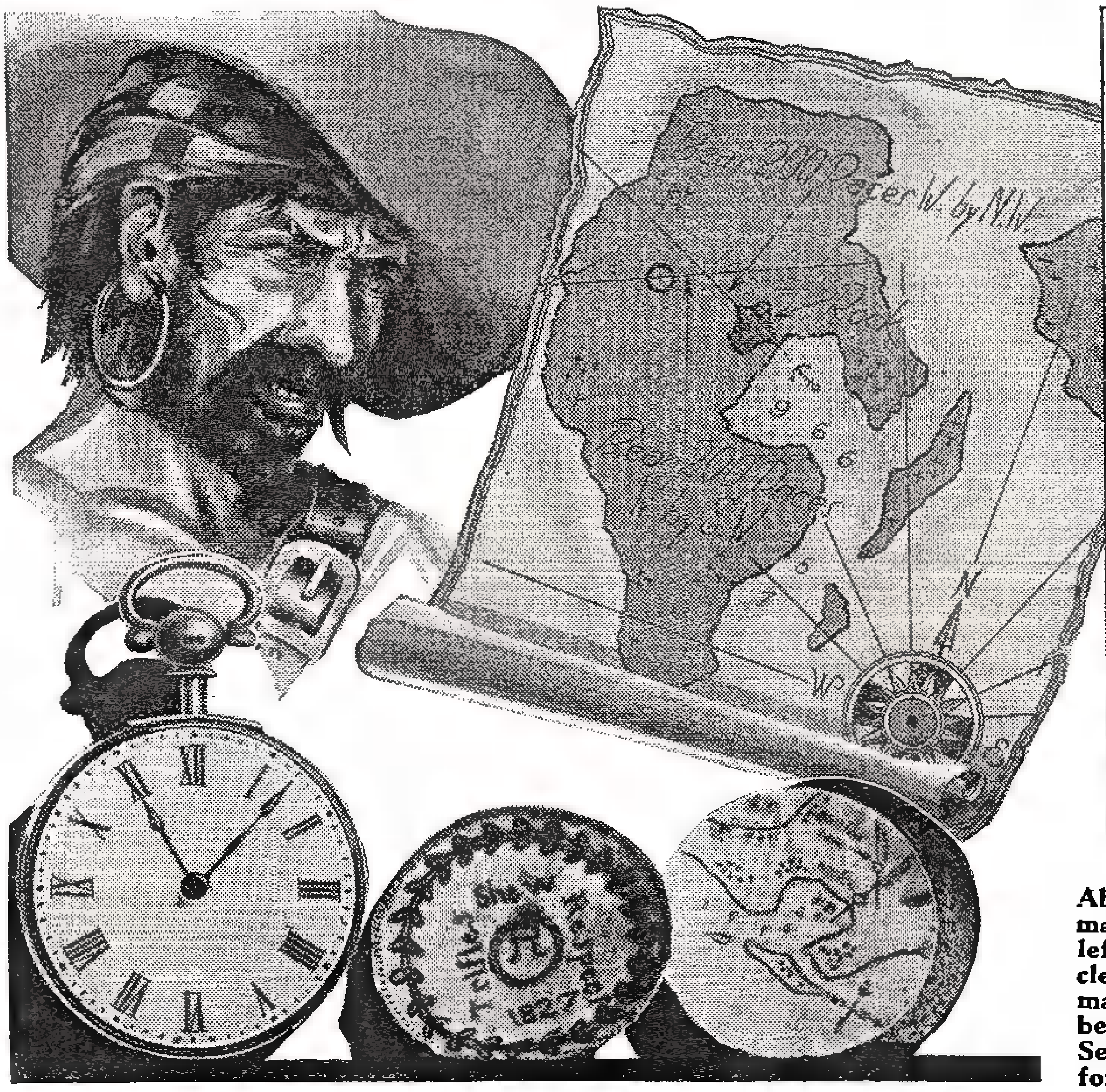
A BED built of old tin cans, perfect in every detail and capable of supporting 1,000 pounds, has been built by J. G. Smith, an unemployed mechanic of Atlanta, Georgia.

Three hundred and thirty-six tin cans of various sizes were used in constructing the bed. Except for the iron locks by which the head, footboard, and siderails are fitted together, and the iron cross pieces which support the springs, no other material was used. Even the bed lamp hanging from the head of the bed uses a tin can for a shade.



336 old tin cans of various sizes were fitted together by J. G. Smith, unemployed mechanic of Atlanta, Georgia, to make this unusual bed which can easily hold 1000 lbs.

"Treasure Map" Discovered in Old Watch



Above is the tarnished old watch inside of which the tiny treasure map, shown at right, and the letter was found.

Above is M. C. Rice, Toronto watchmaker who found the chart, shown at the left, inside an old watch which he was cleaning. The letter accompanying the map told of $250,000 in gold bullion being buried on a small, uncharted South Sea island, and gave specific directions for finding the treasure buried 8 ft. deep.

A CHART and letter giving the position of $250,000 worth of buried treasure on an island in the South Seas was found by M. C. Rice, a Toronto watchmaker, while cleaning a tarnished old watch. He found the yellowed manuscript, protected by a velvet covering, inside a watch which had been given him six years ago by a woman, as payment for a clock repair job.

The treasure map is circular in shape, and cut to fit exactly inside the watch case.

The letter found in the watch is dated 1868, and says: "Paul, my son, I am not long for this world. I fear that I can not bring you this chart as I planned, so the only course left is to hide it in some place and hope you find it. I am the only one surviving with this secret. At the spot shown lies a tidy sum, at least 50,000 pounds *(British)* in gold bars and coin. This island is small, uncharted and far from the main sailing. The rock shown is large, with two small ledges. A line drawn through these bears west, northwest. Lay off 100 fathoms, then bear west, southwest and 100 fathoms more. The chest is buried eight feet. Good luck lad and leave the sea. It is no life for you. J. L. Trinidad."

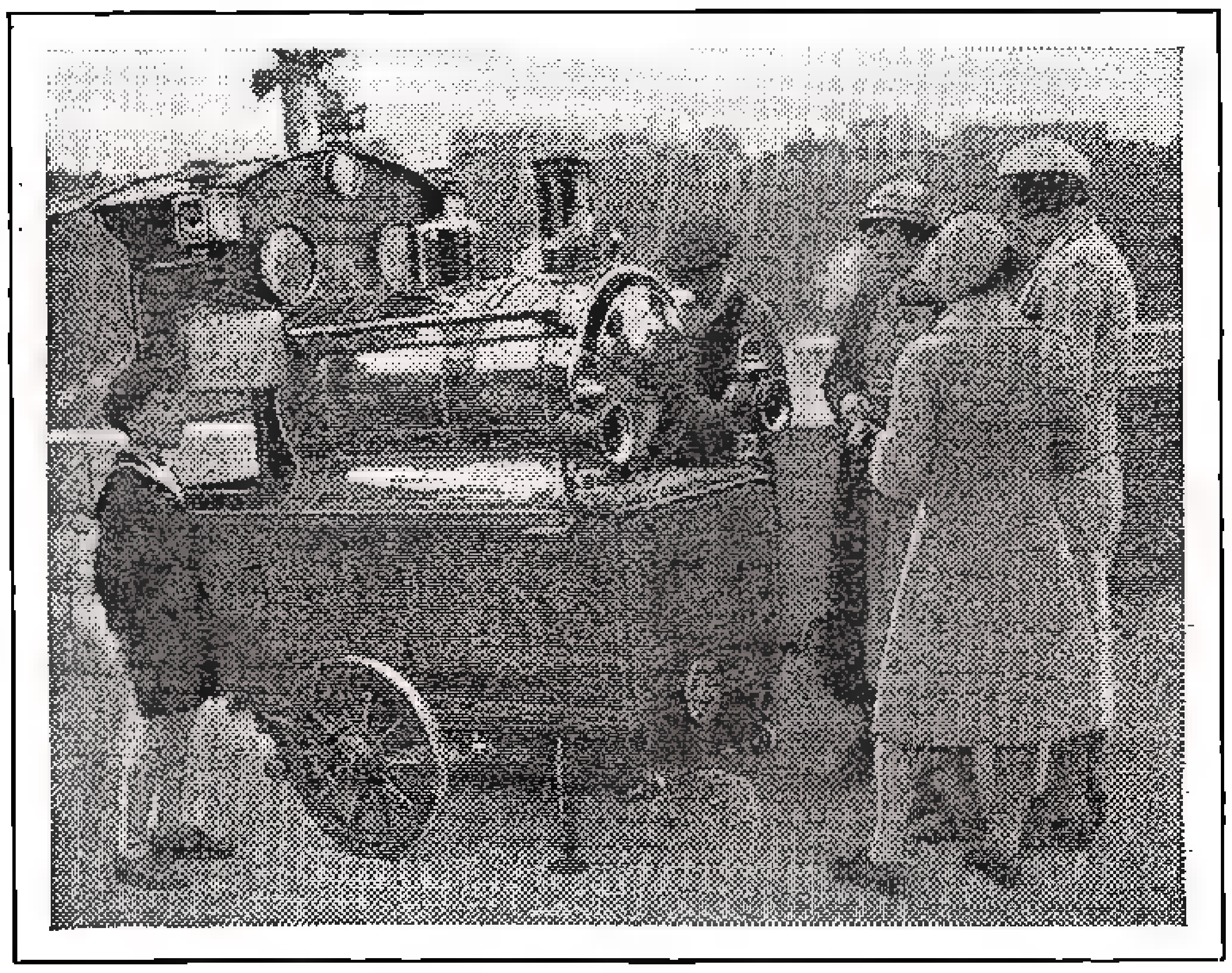
Rice is now searching for the woman who gave him the watch. He believes the letter is genuine, and plans to organize an expedition to search for the hidden treasure.

Popcorn Stand Is a Locomotive

AN ACCURATE model of a locomotive built on a popcorn wagon is attracting considerable attention and has greatly increased the sales of a French popcorn and peanut vendor.

All locomotive parts above the wheels are ingeniously made from sheet metal. A small boiler supplies steam for the locomotive whistle, but this whistle has the characteristic squeaky note of the popcorn wagon.

Corn is popped from the cab by pushing the popper into the firebox.



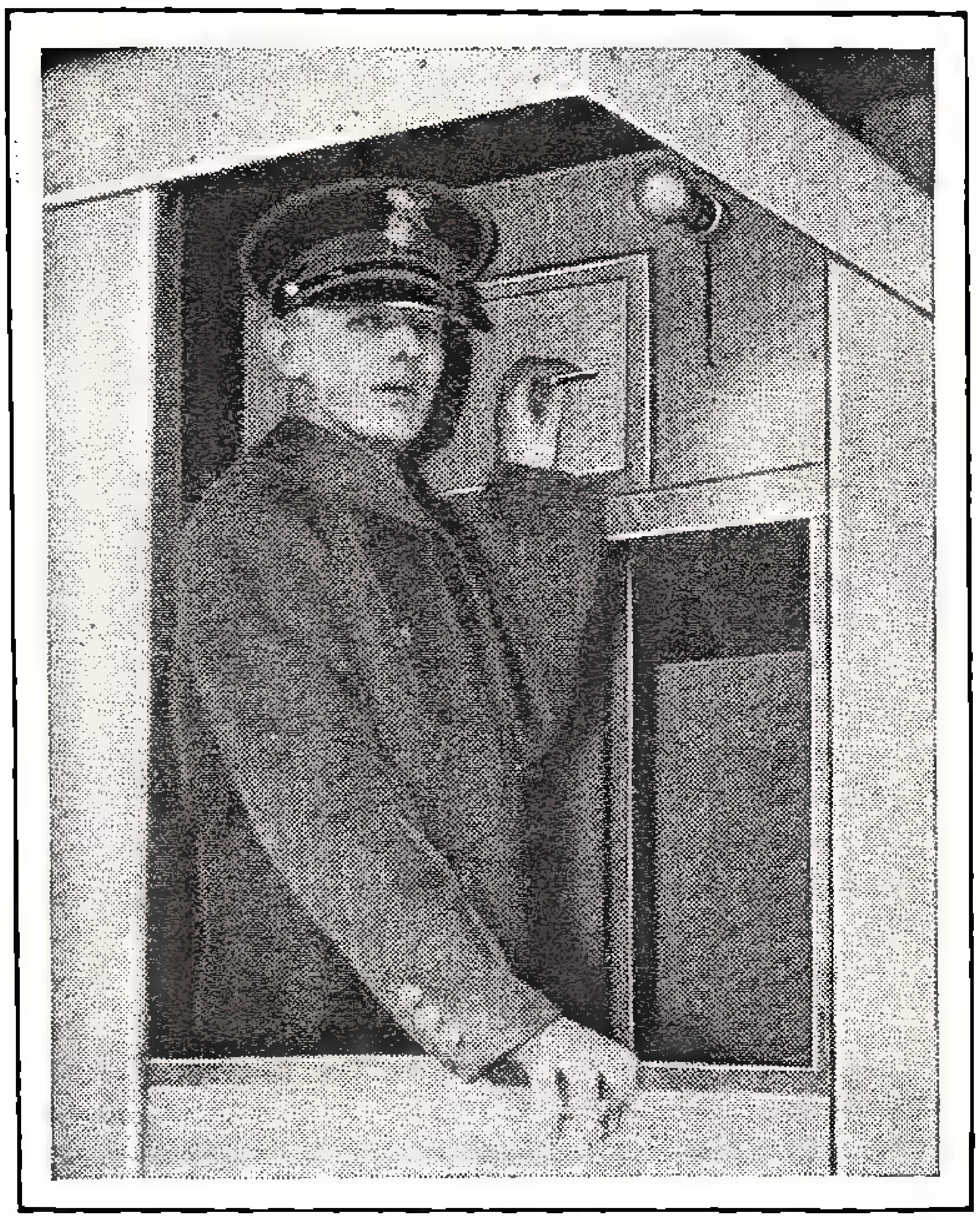
An enterprising French popcorn vendor built this model locomotive on his popcorn cart to attract attention to his wares. Steam is used to blow the peanut whistle.

Steel Booth Traps Bank Bandit, Sends Out Police Alarm

VOWING to rid the city of holdup men, Patrolman Vern Davidson of the Detroit force, has invented a bandit trap which he claims will end the bandit problem.

Looking-like a telephone booth, as seen at the right, the trap is wired throughout for sirens and alarm bells. The door opens at a tangent allowing room for only one man to squeeze in, and must be closed before the entrant can get to the rear of the vault.

When the bandit tries to get back out, he finds himself trapped, for he can open the door only when he knows the combination to the pull-chains which operate the opening mechanism.



New burglar trap for bank vaults has door which closes on bandit when he enters to make away with loot. Only by pulling chains in right combination can he get out.

Boxcar Homes for $3 Per Month

AN INNOVATION in living quarters is represented in a boxcar village which has recently sprung up in New York City.

Inhabitants of this unique village, pictured below, pay only \$3 a month rent, or \$6 a week for room and board—reasonable enough in these hard times.

Each boxcar—there are 40 in number—is equipped to sleep four men with respectable comfort, and has a wood stove, washing accommodations, and a carpet.

When good times come back—which won't be long now—the village will probably be abandoned.

Alert business men, however, or leaders of groups of organized unemployed should take a tip from this project and petition the heads of their local railroad for the use of old box cars and spurs. A very useful community can be built from the bodies of old box cars, as they are in the most cases very well built to carry grain and other perishable bulk commodities, and hence make easy buildings to convert into livable homes. Being tight they are easy to heat. A winter's supply of wood for the community can be had by wrecking other cars.

Patient's Heart Stops 4 Minutes

A REMARKABLE surgical operation in which a patient's heart was held completely still for four minutes so that a blood clot could be taken out, was reported from a clinic in Stockholm, Sweden. The Swedish surgeon opened the patient's chest and made an incision into the heart, removing the offending clot. The wound in the heart was then sewed up and the heart was then massaged till it began to beat again. The heart was said to have been absolutely still for four minutes, nevertheless the patient recovered.

Hundreds of New Yorkers who've been stricken by the depression find comfortable living quarters in this boxcar village, where they pay \$3 a month rent and have many desirable home comforts, including a stove and carpeted floors.

GUNS from All NATIONS

Extreme precautions are taken by movie studios in handling the very real weapons used in filming modern thrillers. Left shows an expert marksman doing his stuff when the script called for a shattered door. Such times, sets are cleared of all hands. Above—A war scene from "Bitter Tea of General Yen."

One type of prop the movies never need to fake is a gun. This is but a part of the arsenal at the Paramount Studios, where weapons of every conceivable vintage and type are kept under double lock and key to prevent mortal accidents either in use or while in storage. Here revolvers of all kinds from a six gun to a pearl handled pistol are stored.

THE machine guns of the beleaguered garrison, making a last stand, are rattling and spitting fire at an enemy whose rifles and revolvers crack viciously in reply. Casualties are strewn everywhere and the acrid smoke of battle hovers over the scene. It is a critical situation, indeed—or appears so.

Then the director shouts "cut," and the "dead" and "wounded" arise and brush themselves off. For it is only a scene from a current talkie, and no one is really "wounded in action."

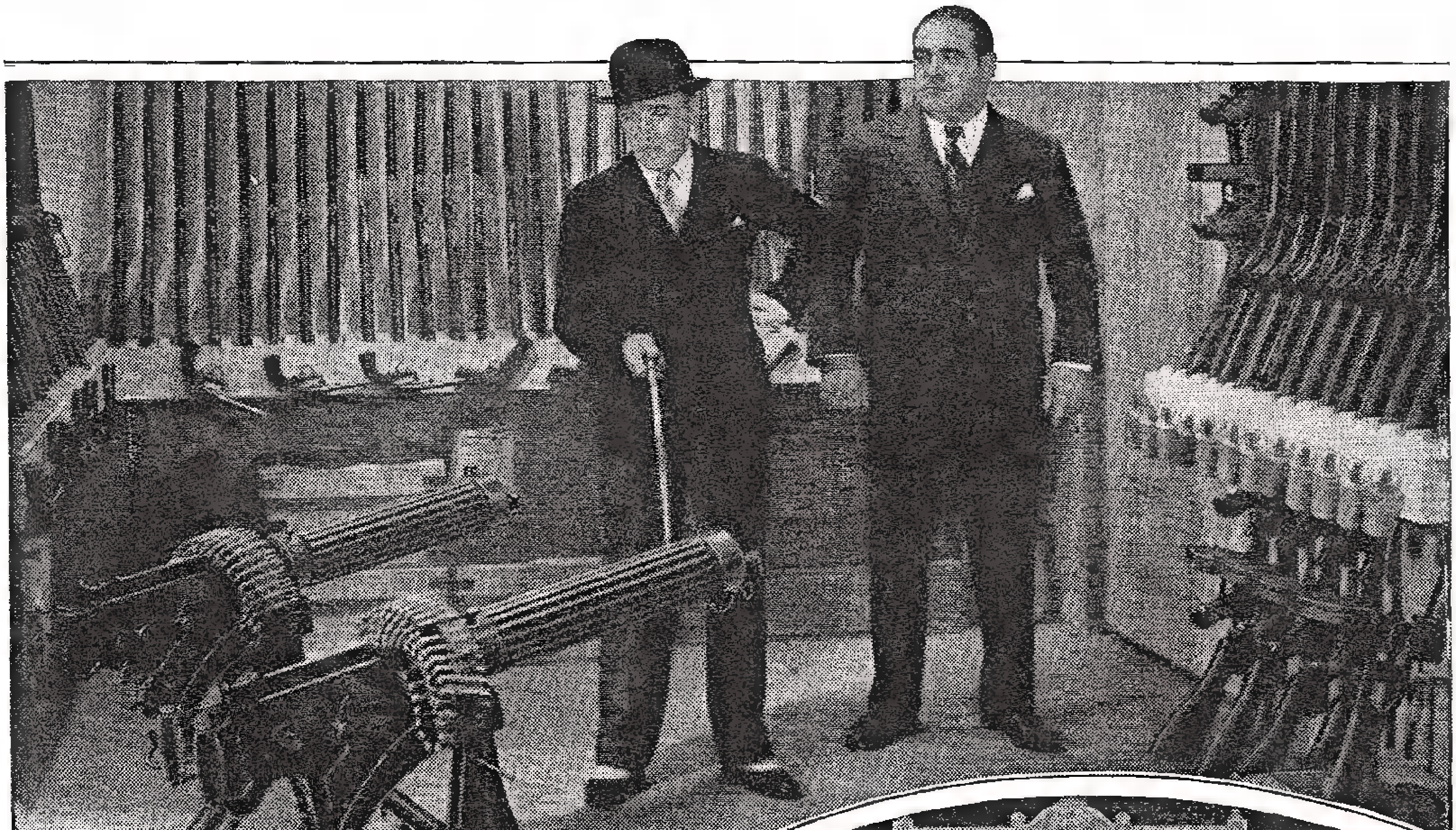
Prevention of Accidents

Yet accidents might easily occur in making just such movie scenes as this, where firearms are used promiscuously. Unless extraordinary precautions are taken, a real bullet, for instance, might find its way into the thousands of blanks that are fired. And even the blanks themselves might cause severe powder burns and disfigurements within ten feet of firing. For this reason the motion picture studios employ every safeguard possible in the handling of guns and ammunition.

Indeed, as James Stembridge, firearms expert and custodian of the Paramount Studio arsenal, puts it, "Our precautions include everything but hanging a red light on the guns."

"No company on the lot," says Stembridge, "can get firearms, particularly machine guns or ammunition, to use on sets

Stock MOVIE Arsenals



Roland Young and Dewey Robinson, well known Paramount featured players, inspect a corner of the Paramount arsenal, where machine guns and special army-type rifles are stocked.

without having a permit signed by the head property man. And no outside studio can rent guns from Paramount without a special permit from the State of California.

"We keep a record of each gun that goes out of this arsenal—serial number, type, etc.—and we know every minute of the time it is in use just where we can put our hands on it.

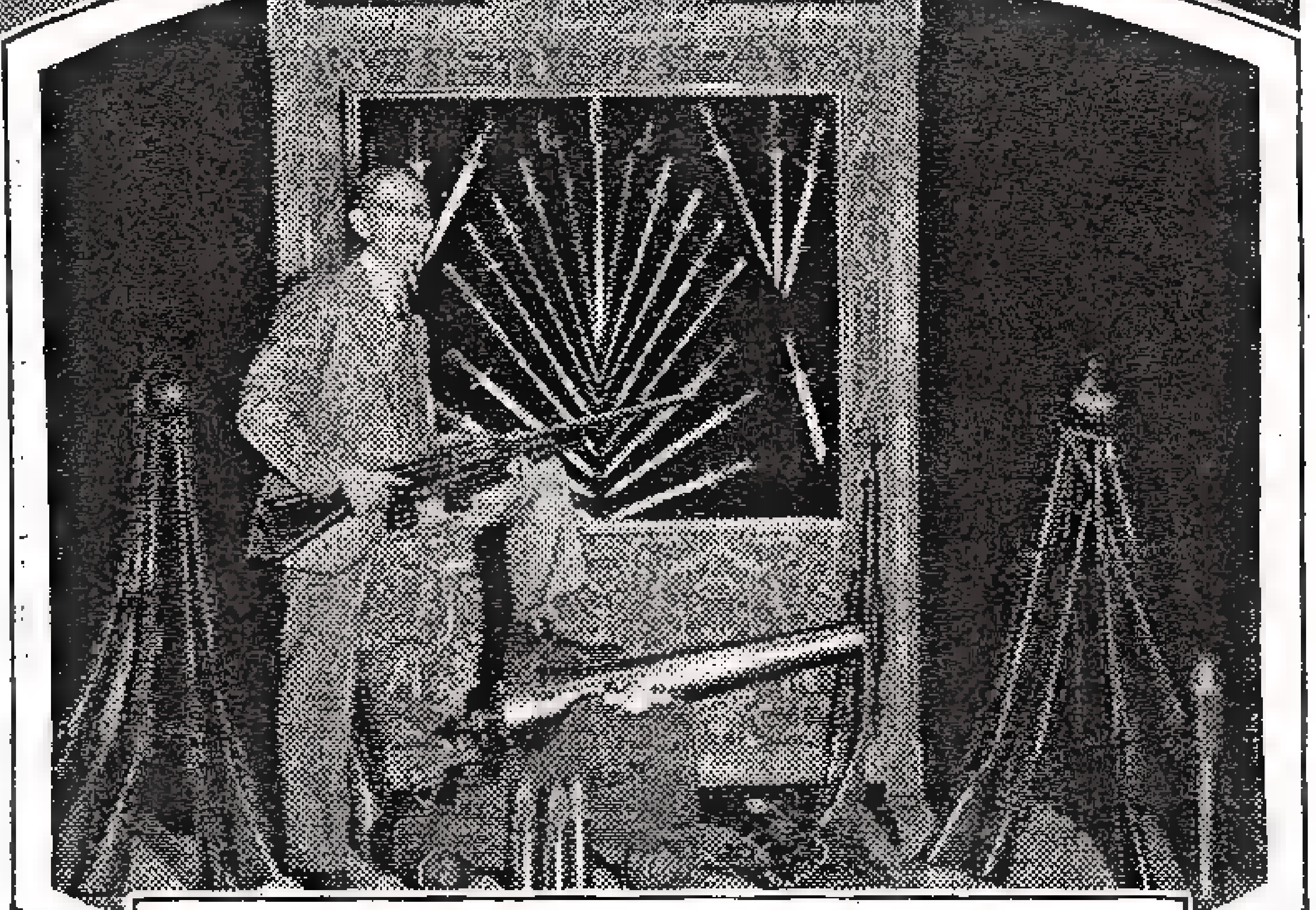
"Our machine guns are kept in vaults and our ammunition in magazines under double lock and key. It is not only impossible for them to be stolen, but no careless person can tamper with them at any time."

When the arsenal gets a properly signed order for guns and ammunition, the weapons are carefully examined by the firearms expert and then locked in boxes to which the head property man has the keys. These boxes are delivered to the set where the company is working. The blank ammunition is also delivered in separate lockers, thus blocking any chance of the guns being loaded by an unauthorized person.

Rehearsals are then gone through, and the scene made ready for actual filming. The head property man in the meantime has loaded the weapons which will figure in the sequence. There is a final pause, when the action side of the set is cleared for forty feet.

Now the director signals "camera" and

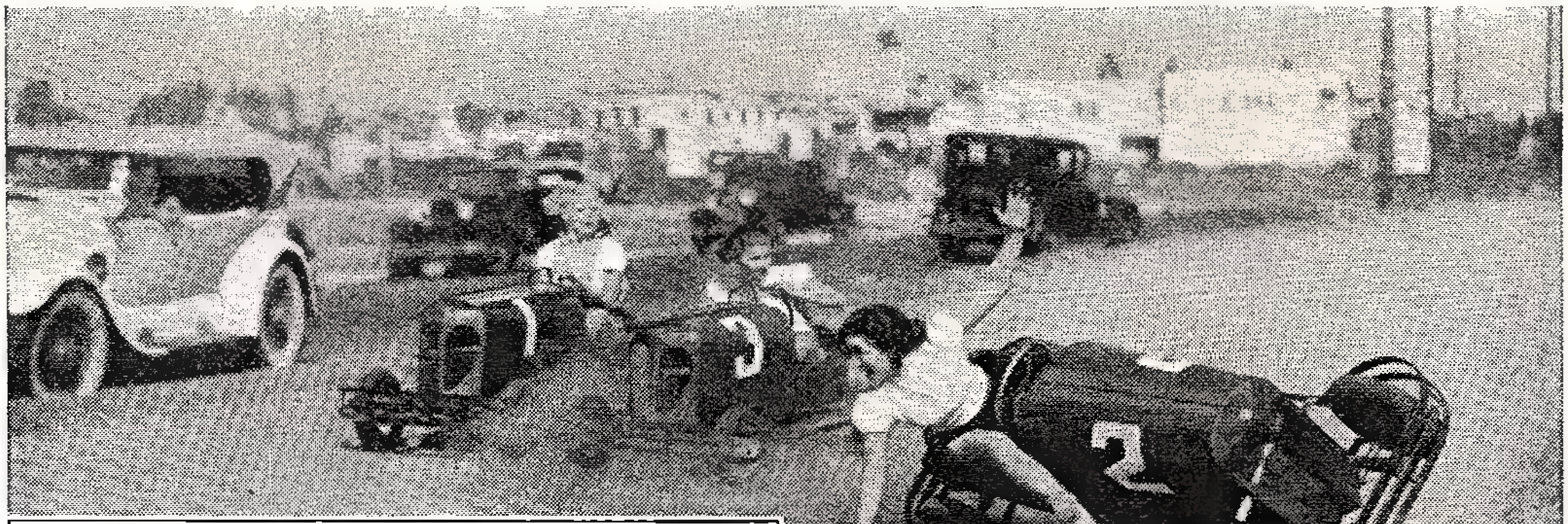
(Continued on page 128)



James Stembridge, custodian and fire-arms expert for Paramount, also knows his knives. In his care he has a collection of bayonets for all types of guns used by all nations.

When a special model of gun is called for, such as a flint-lock, movie realism demands that powder smoke issue not only from the muzzle, but the breech lock as well.

Miniature Racing Cars Are Latest Fad in Hollywood



Watch those curves, lady, or you'll take a bad tumble! Lona Andre is finding out just how fast the track is skidding under her as she takes a spill in her miniature racing car. "Putt-putting" is Hollywood's latest fad.

The start of one of the miniature car races that are taking the feminine population of Hollywood by storm.

"PUTT-PUTTING" in miniature racing cars, Hollywood's latest fad, is making a hit with the fair young ladies of our film capital.

Tiny one-lung gasoline engines give more than enough speed to the tiny cars, and even the wisest of feminine drivers have been known to take spills on the curves.

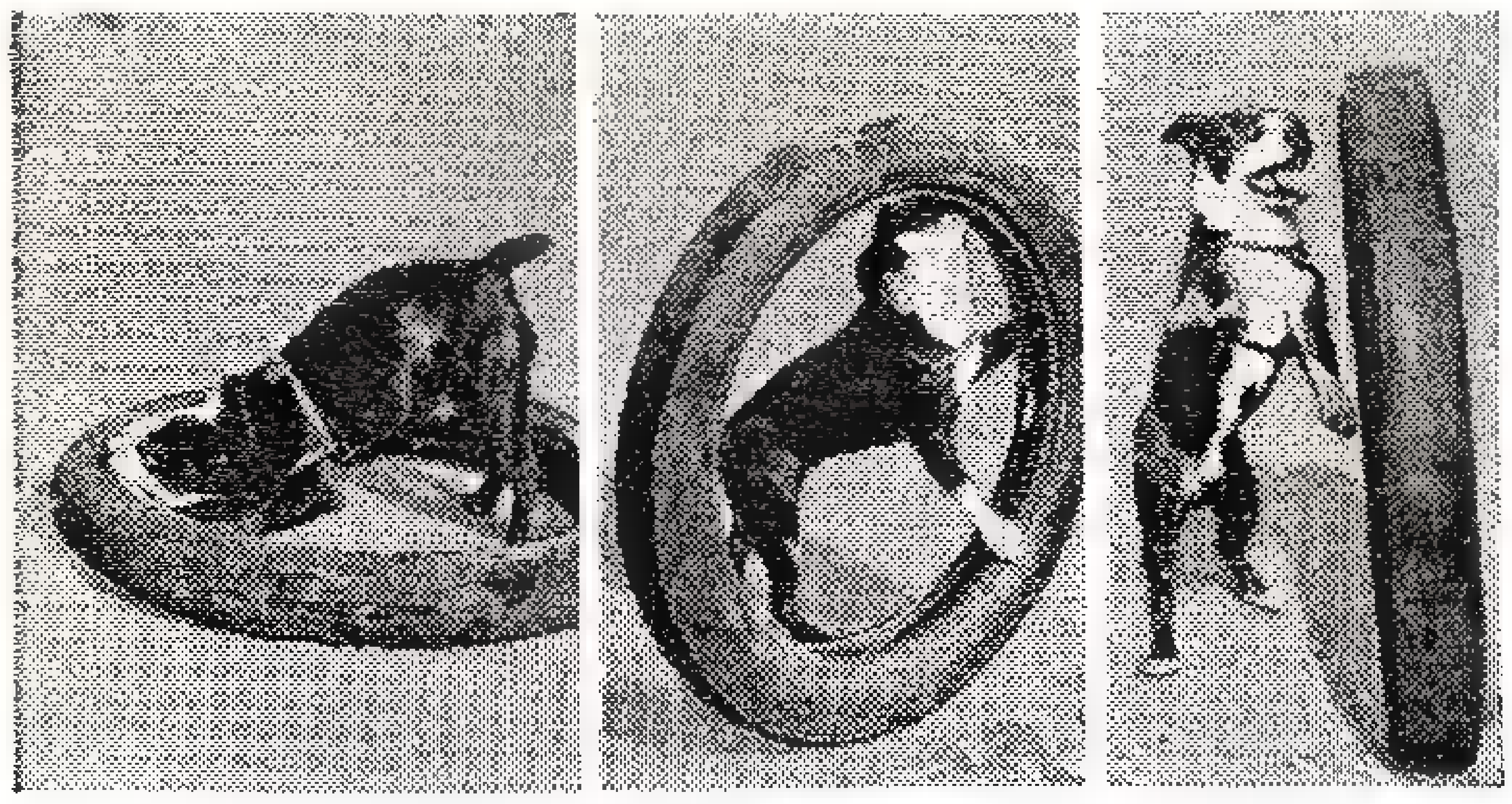
Races are held on the city streets, with starters, movie cameras to catch the spills, and of course mechanics to tinker with the motors when trouble threatens.

Dog Rolls Tires for Sport

ROLLING old automobile tires down the street is the favorite sport of Mickey, a Boston bull dog owned by M. Brown of Venice, California.

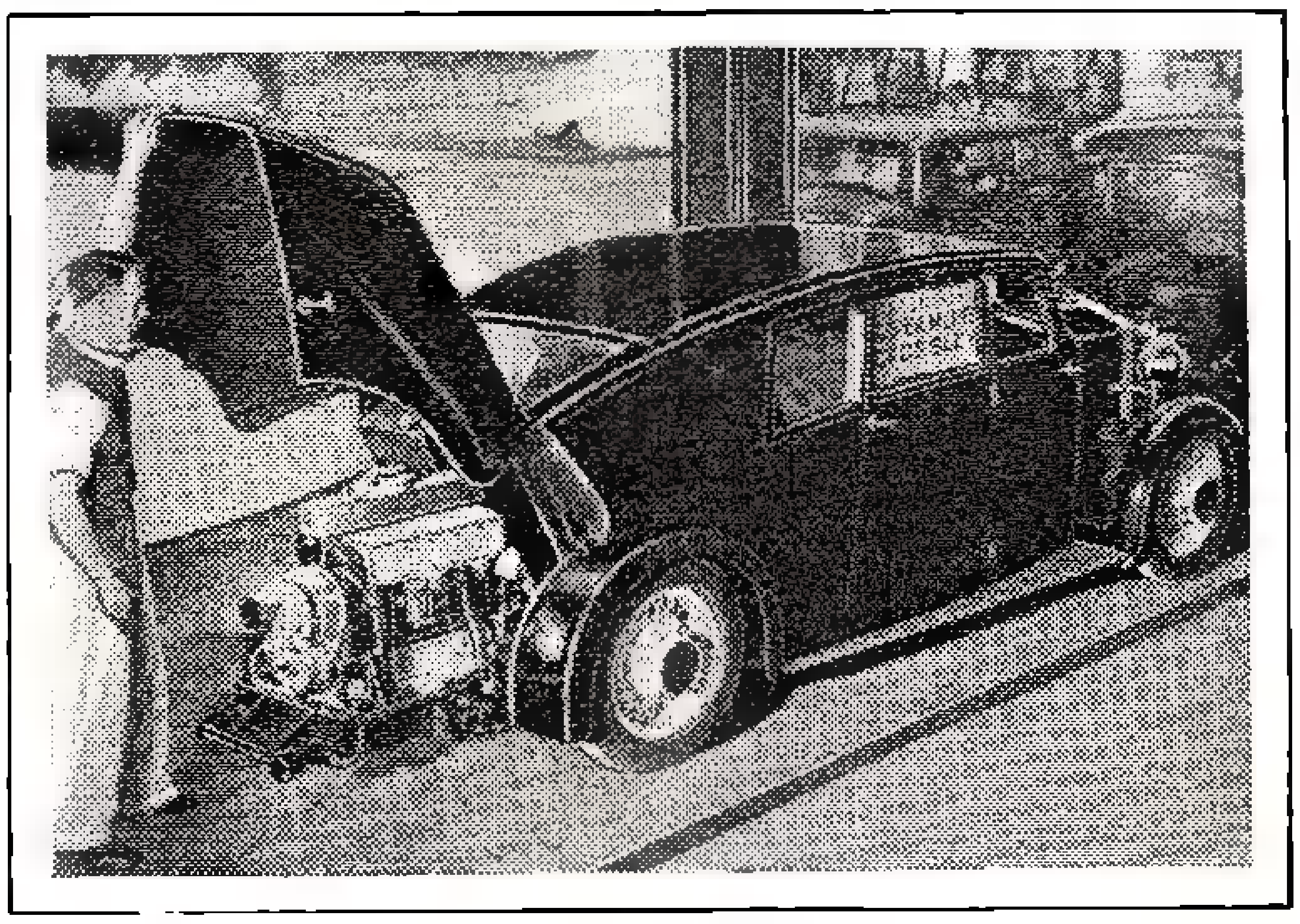
Mickey, who always had a liking for anything that rolled, learned to pick up the tire, balance it, and keep it rolling down the street without any aid or suggestion whatsoever from his master. A skillful push with his front paws, as he runs along on his back feet, keeps the tire moving.

It just wouldn't do to leave a new tire lying about near this dog's territory.



Mickey raises the tire from the ground with his teeth, balances it carefully, and gives it a push down the street. He can keep the tire rolling as long as he likes.

New Cars Have Engines at Rear

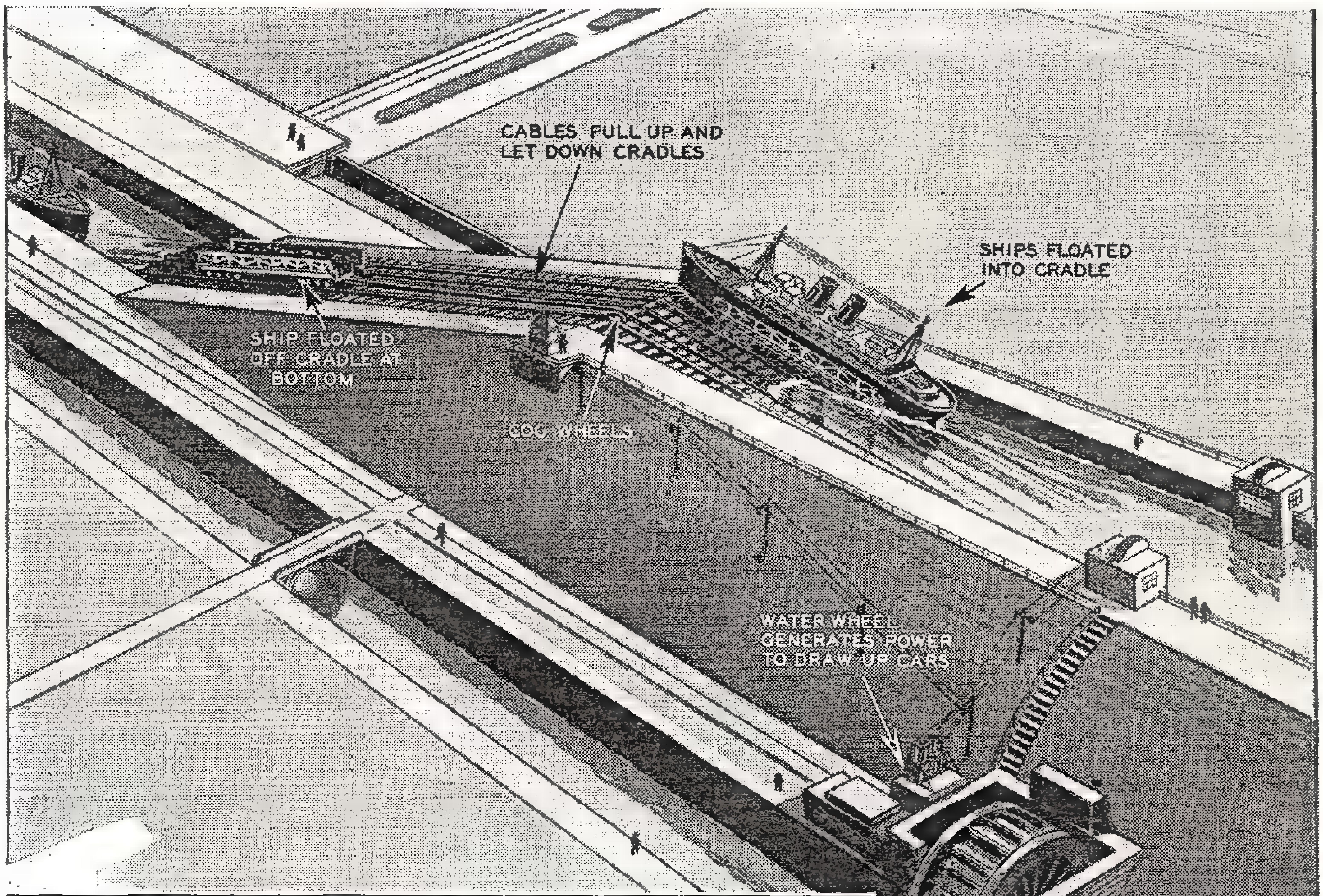


This stream-lined midget car exhibited at a Berlin auto show has its engine mounted directly back of the rear axle. Rear panel raises to allow access to the motor.

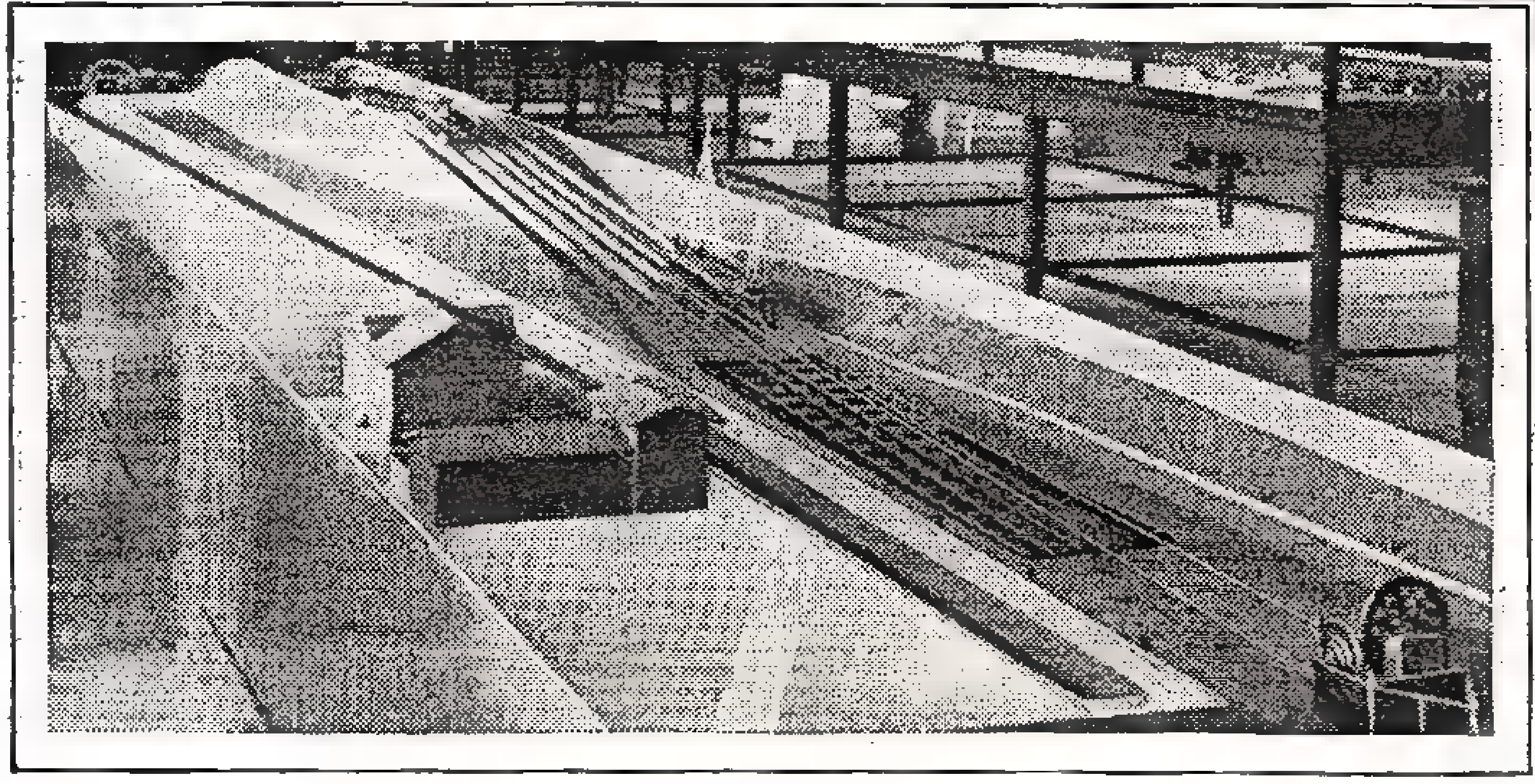
ONE of the most popular midget cars at a Berlin auto show is powered by a small four-cylinder gasoline engine mounted on a framework directly back of the rear axle.

A steel cover in stream-lined design cuts down wind resistance at the rear, and raises to allow access to the motor.

Ships Hauled by Rail Over Canal Lock


CABLES PULL UP AND LET DOWN CRADLES
SHIPS FLOATED INTO CRADLE
SHIP FLOATED OFF CRADLE AT BOTTOM
COG WHEELS
WATER WHEEL GENERATES POWER TO DRAW UP CARS

A ship resting in a cradle car is being lowered by rail in the above drawing of the new type lock. Another ship has been floated by car.



A working model of the rail canal lock designed by German engineers is shown above. The motor at the right pulls the cable which hauls the cradle cars holding the ships. In the actual lock the motors will be housed in buildings.

BY LIFTING or lowering ships from one water level to another on large cable cars German engineers have eliminated the usual complicated system of gate locks in a canal in East Prussia.

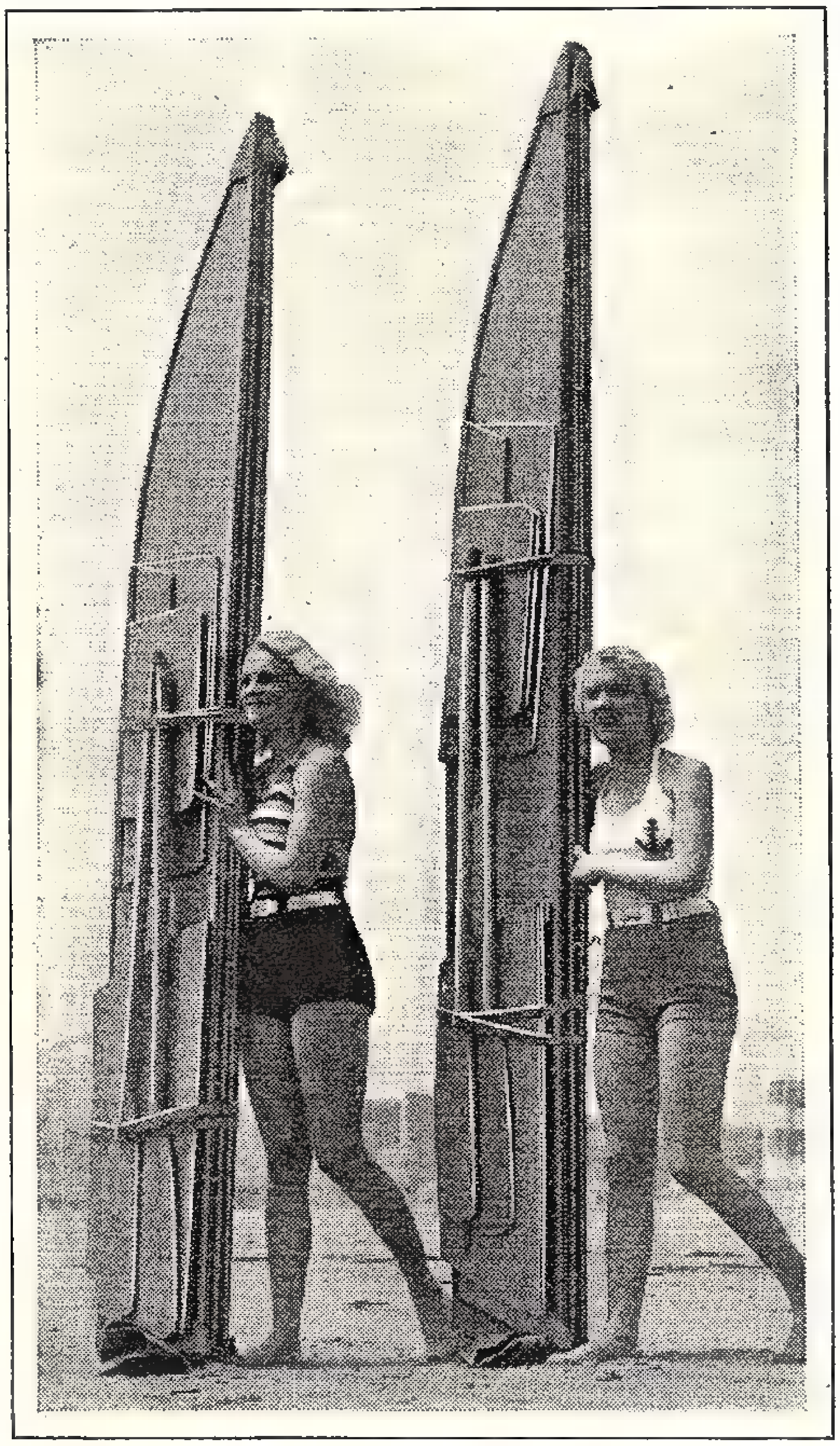
Hauling the ships by rail also greatly reduces the time required to transport ships. The entire process of carrying a ship over the lock takes less than 15 minutes.

The car used is a large cradle on wheels towed by a cable. It runs on rails under the water. The ship's hull glides over it and moves along with the car. As the car starts to move uphill the ship settles firmly into the cradle.

Powerful hoisting motors tow the car and the ship up an incline to the higher level of water or lowers them gradually to the lower level. Electric power for the motors is supplied by a hydro-electric turbine at the side of the lock which takes advantage of the difference in water level for motive power. The motors are housed on each side of the top of the incline.

A working model of the lock has been built by the engineers and is now on exhibition in Germany. Actual construction will be begun soon in a canal near Elbing in East Prussia. The German designers of the rail lock claim that it greatly reduces the cost of building canal locks and also the expense of operation. To a person standing some distance from the lock the ships appear to be crawling over a hill.

New Lightweight Folding Boat Compact for Easy Portage

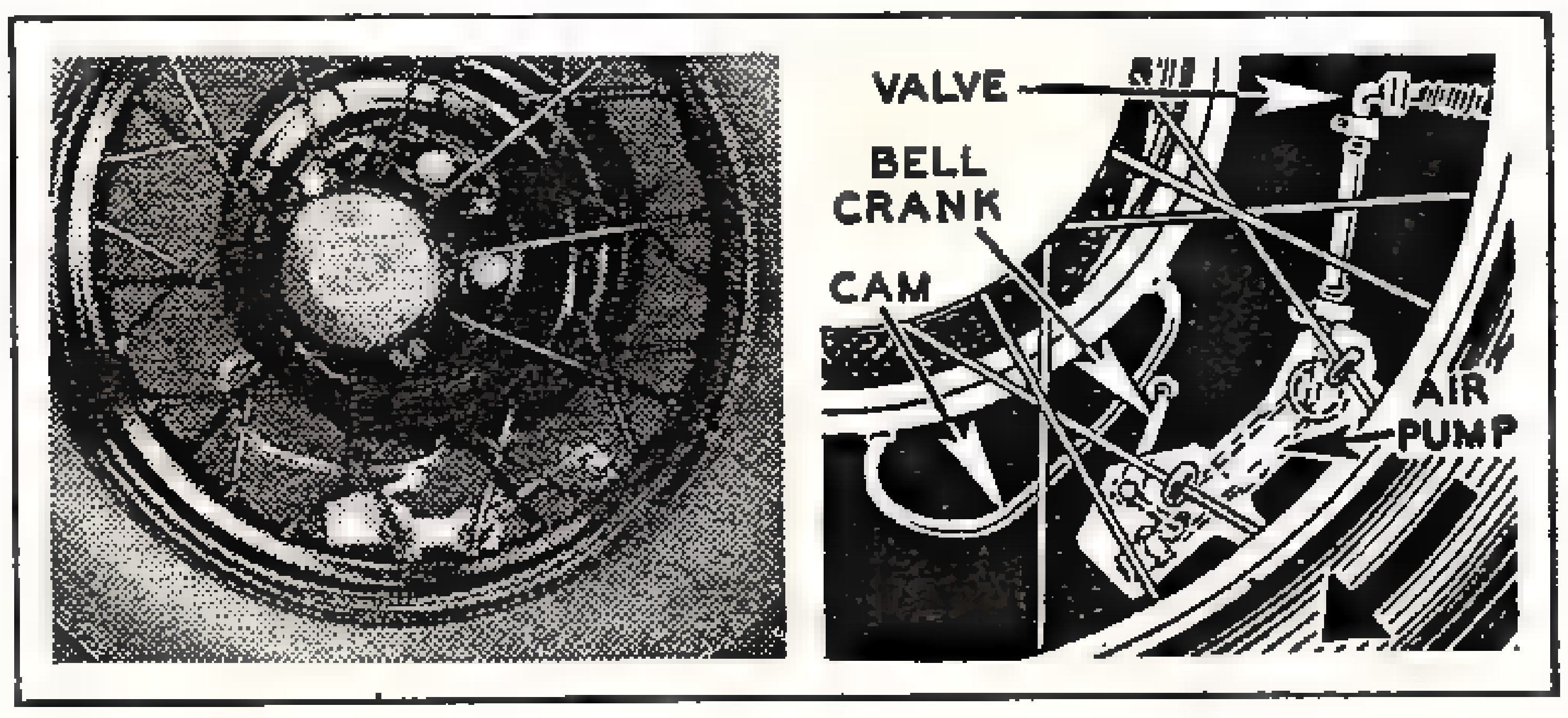


The compactness of new folding boats, which are made of laminated wood and heavy canvas, is shown in photo above. The boats can be quickly prepared for the water.

COMPACTNESS and portability feature a new folding boat made of laminated wood and heavy canvas.

Oars, crosspieces and boat tie into a simple bundle that can be carried easily by the outdoor man or fastened to the top of an automobile. Reinforced canvas forms the seams joining the wood sections. When opened and the crosspieces are put in place, the boat is ready for the water. Harold F. Wilson of Los Angeles is the inventor.

Wheel Runs Automatic Tire Pump



When air pressure drops this pump automatically releases the bell crank which pumps up tire while car is moving.

AN AIR pump, that automatically keeps tires at the correct pressure while an automobile is moving, has been invented by A. G. E. Nordquist, of Denver, Colo.

The pump is attached to each wheel. When the pressure falls below the mark set on the gauge, a crank is released. A cam on the brake drum drives the crank of the air pump until the tire reaches the correct pressure.

The pumping function then automatically ceases until more air is released. Now someone should invent a deflator so that when a tire gets hot it will deflate.

Motor Uses Half Teaspoonful Oil

ONLY a half teaspoonful of oil will lubricate the smallest airplane motor in the world.

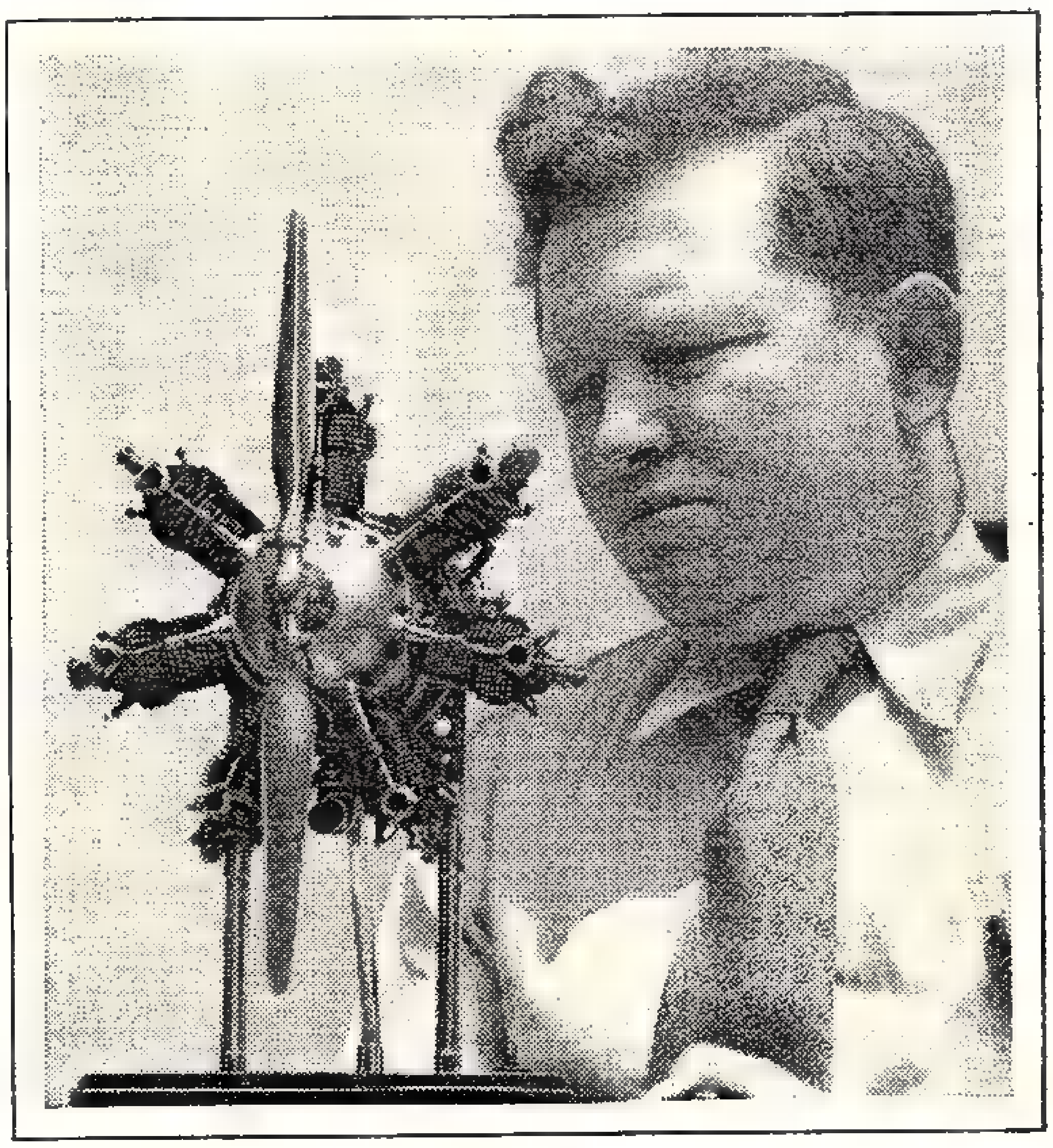
The motor of the radial type is slightly over 13 inches high. It turns a propeller one foot long on a propeller shaft of tooled steel revolving on two Fafnir ball bearings. Fourteen tiny sparkplugs, a starter and small carburetor are among other interesting features of this motor designed and built by F. W. Gradiner.

The rocker arms are chrome plated. The timing gears have a ratio of 6 to 1. They have 3/16-inch faces. The push rods of the motor are of tool steel and are adjustable. The motor is oiled by gravity and splash.

Gradiner exhibited his miniature motor at the recent National Air Races. He values his model at $2,800.

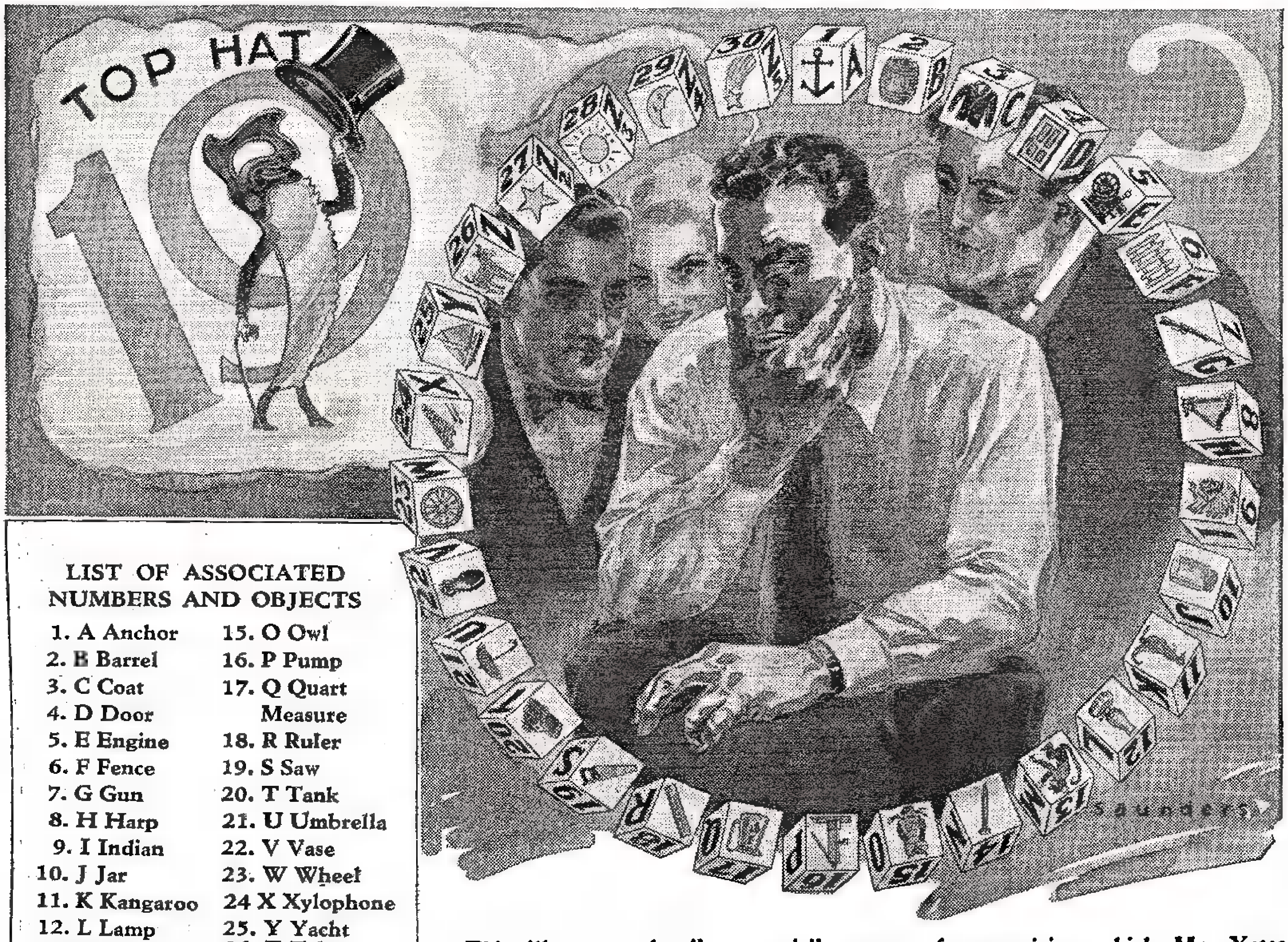
The motor and its builder are shown in the picture to the right.

Gradiner informs us that his motor was built on an ordinary 9-inch South Bend lathe, no special tools being required.



The smallest airplane motor ever built is shown in photo above. It is of the radial type and is slightly over 13 inches high. The designer, shown in the picture, is F. W. Gradiner.

Simple Memory Feat Amazes Party Guests



LIST OF ASSOCIATED NUMBERS AND OBJECTS

1. A Anchor
2. B Barrel
3. C Coat
4. D Door
5. E Engine
6. F Fence
7. G Gun
8. H Harp
9. I Indian
10. J Jar
11. K Kangaroo
12. L Lamp
13. M Monkey
14. N Nail
15. O Owl
16. P Pump
17. Q Quart Measure
18. R Ruler
19. S Saw
20. T Tank
21. U Umbrella
22. V Vase
23. W Wheel
24 X Xylophone
25. Y Yacht
26. Z Zebra

Extra symbols as needed

This illustrates the "mnemonic" system of memorizing which Mr. Yates describes. Each number in a list of 26 or 30 numbers is associated with a master group of objects. When presented with an impromptu list, five minutes is given a person to associate the secondary list with the master list. By association of objects the second list becomes easy to recall.

by R. F. YATES

OF ALL of the tricks performed at parties attended by the writer, not one has mystified or baffled those present any more than the memory trick about to be outlined. The master of it, when he enters into competition with any number of people, however intelligent, however learned, is able to demonstrate a faculty for memory that will amaze and dumbfound everybody present. All of this entertainment can be the reward of but an hour's intensive study in learning the very simple but very effective mnemonic system that has been devised by the writer.

Association, Secret of System

A psychologist will tell you that whatever we learn must in some way be related to something that we already know. It is largely through this power of associating one thing with another that we learn and memorize things. That is the secret of our system; we simply learn a set of words in a peculiar manner. Then during a memory test, that may be instituted as part of an evening's entertainment, we are asked to memorize thirty words. Given five minutes in which to fix them in our memory, we surprise those present by reeling the words off like lightning at the end of this study period. We not only do that, but we offer to call off the word of any particular number—3, 10, 19, 25 or what have you? The only requisite is that the words chosen be nouns for it is much easier to operate under this condition. The person giving the words to the group should also use numbers, that is he should number each word used from 1 to 30.

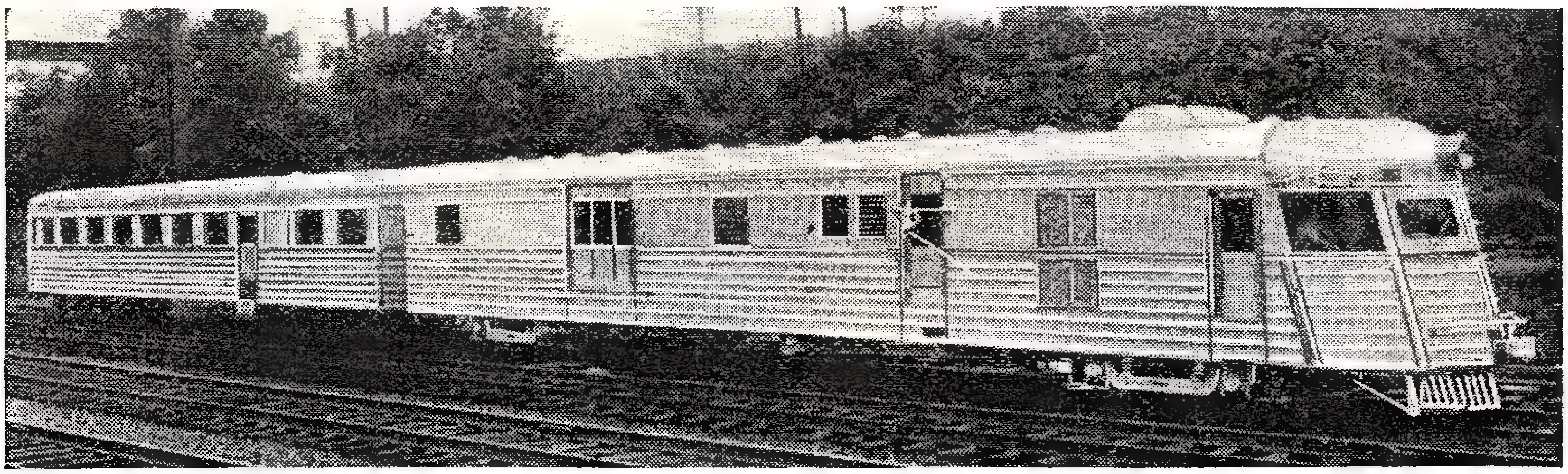
Thirty Symbols Used

Here is the method: First we write down numbers from 1 to 30. Then at side of these numbers we place the letters of the alphabet, beginning with A as 1, B as 2, and so forth until the twenty-sixth letter is reached. The two extra spaces are filled with ZZ and ZZZ. This is done just to produce a round number.—See picture above.

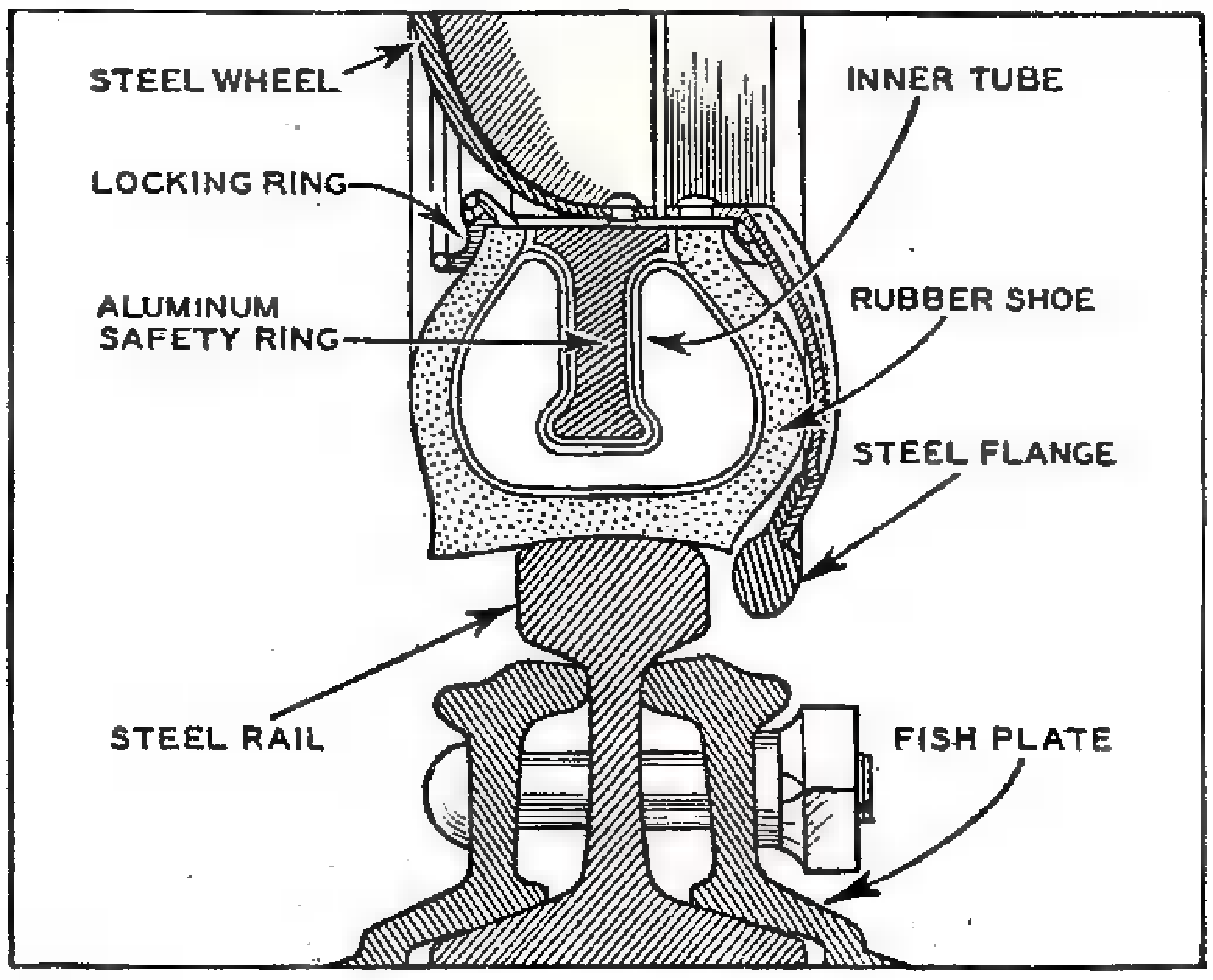
This list should be studied until the "memory expert" is able to learn the number of each word used and to memorize thoroughly the word itself. For instance, when H is thought of the performer should immediately think of 8, its number. The list should be memorized so well that no

(Continued on page 122)

Rubber-Tired Train Makes 75 m. p. h.



Riding entirely on rubber, this shiny, two-car stainless steel train makes up to 75 m.p.h. A gas-electric drive is used. Moderate stream-lining cuts down wind resistance.



Sketch shows how rubber tires are kept on rails. Steel flange on inside of wheel keeps grooved rubber tires on track. Train rolls on solid aluminum safety rim inside of tire in case of a blow-out, wheel dropping but ⅝ inch.

RAILROAD officials throughout the world, alarmed at the rapid decrease in their passengers, are taking drastic steps to regain their lost traffic. New high speed cars, light in weight, stream-lined, and ultra-comfortable, are being put in operation to better serve the public.

A two-car stainless steel, air conditioned, gasoline driven train, a veritable masterpiece of metallic art, is now running between Fort Worth and Texarkana at scheduled speeds of up to 75 m.p.h. Features symbolic of the "New Deal" in transportation are the rubber tires, rubber cushioned trucks, sealed windows, and the use of "18 and 8," a new chromium-nickel-steel alloy, for the metal body.

The first car of the train contains a railway post office, a baggage compartment, and the power plant. Two 12 cylinder gasoline engines of the automotive type drive two generators which in turn operate powerful electric motors directly connected to the car axles. With this arrangement the gasoline engines always run at their most efficient speed, and electric motors drive the car with a minimum of gears.

A radical reduction in weight per passenger enables operating costs to be cut to 35 cents per mile, making the train no more expensive to run than a heavy bus.

Grooved rubber tires carrying 100 pounds air pressure ride on the rails, carrying the entire weight of the car. On the inside of each wheel is a steel flange which keeps the tires on the track.

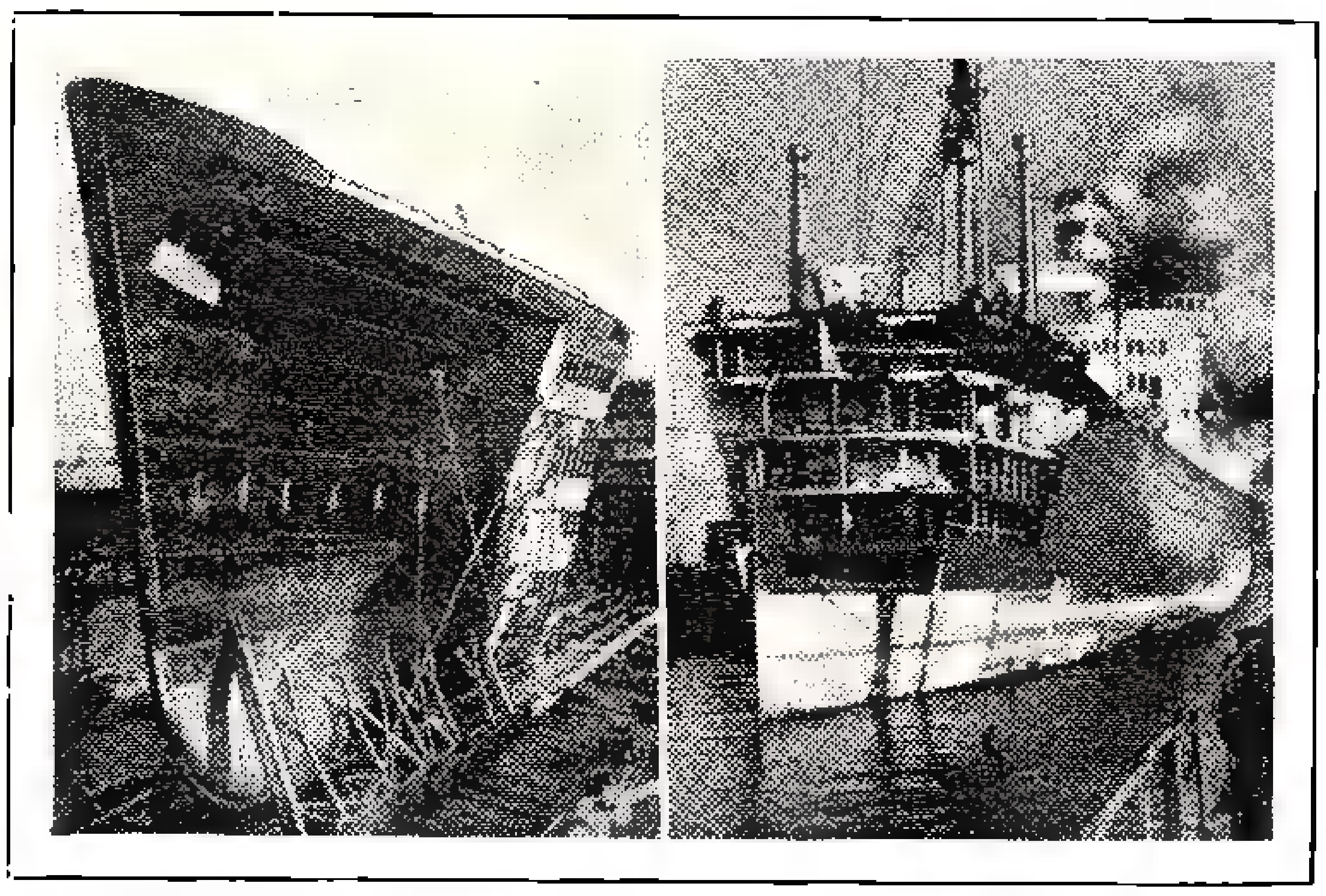
An aluminum safety rim inside the tire holds up the car in case of a blow-out. With deflation of the tire the wheel would fall only five-eighths of an inch.

In a recent test two tires were punctured by shot-gun fire while the train was traveling at 50 m.p.h. Passengers heard only a faint thud and the train kept speeding along.

German Ship Gets "Face" Lifted

THE German steamship "Hamburg" is having a major operation performed on it by shipbuilders.

The old bow is being completely cut away in drydock, and a new bow, some 40 feet longer, will be riveted and welded into place. A great portion of the new bow will lap into the old ship framework, giving additional strength to the joint. Three other German passenger ships will undergo similar lengthening operations.



The German steamship "Hamburg" undergoes a major operation. Right: Ship being towed into drydock, with most of old bow cut away. New bow at left adds 40 ft. to length.

Youth Designs RADIO Phone Exchange

AT 16, D. Reginald Tibbetts was hailed as a "boy genius" because of his work in establishing the first police radio system on the Pacific coast.

And now, at 22, Tibbetts, a senior at the University of California, is blazing another trail in the interests of science by installing an ultra-high frequency radio telephone system for engineers on the $75,000,000 bridge between San Francisco and Oakland, destined to be the world's mightiest span.

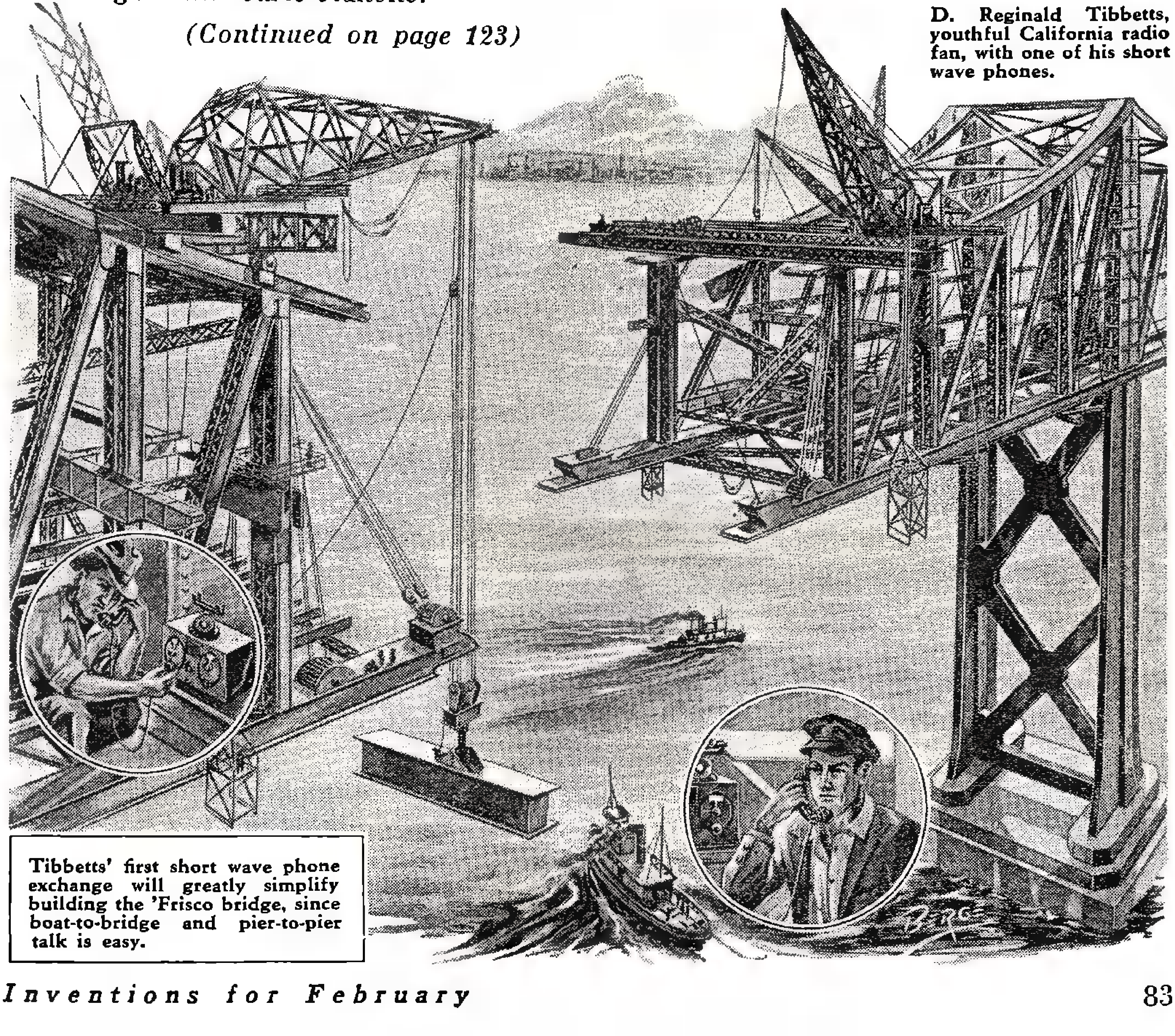
The story of Tibbetts' achievements is the record of a "radio wizard" whose success was brought about through an insatiable curiosity—a burning desire to find out "why"—coupled with plenty of downright hard work in the solitude of a little attic room at the home of his parents in Berkeley, Calif.

It was back in 1927 that Tibbetts, a lad in high school, walked into the office of August Vollmer, then chief of Berkeley's famous "scientific" police department, and outlined to Vollmer the details of a plan for police communication by radio.

Struck by the lad's sincerity and knowledge, and ever anxious to utilize the latest creations of science in police work, Vollmer assigned two officers to help Tibbetts and gave him *carte blanche.*

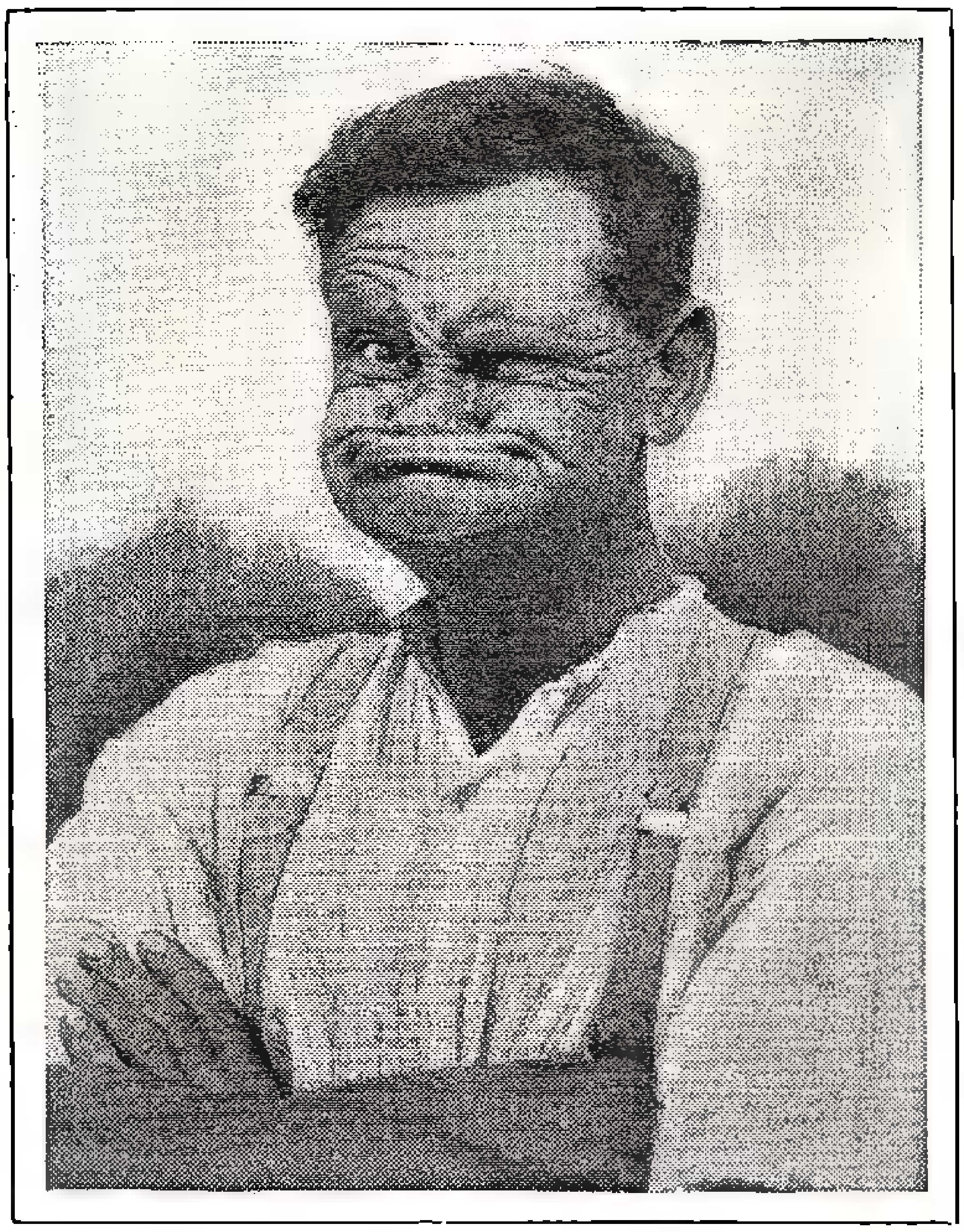
(Continued on page 123)

D. Reginald Tibbetts, youthful California radio fan, with one of his short wave phones.



Tibbetts' first short wave phone exchange will greatly simplify building the 'Frisco bridge, since boat-to-bridge and pier-to-pier talk is easy.

Englishman Swallows Nose to Pull World's Ugliest Face



T. Cox, of Yarnton, England, the man with the India rubber face. He challenges the world to pull an uglier face.

THE man with the India rubber face is T. Cox, a farmer of Yarnton, England. He challenges anyone in the world to pull an uglier face than he can. So limber are his facial muscles that he can do just about everything but tie his cheeks into a knot.

Cox is able, by drawing up his lower jaw, puffing out his cheeks, and raising his lips up over his nose, to give the impression of having swallowed his nose.

No "bogeyman" is needed in this little town, for he can scare even the bravest of the little tots into eating their spinach.

Dog Is Mother to Baby Rabbits

BESSIE, a three-year-old purebred Alsatian dog in Orsett, England, had no puppies of her own, but longed for something on which to lavish her affections.

She adopted a baby rabbit, and was happy for a time. The rabbit died, however, and Bessie was so grief-stricken that her master bought her a tame rabbit.

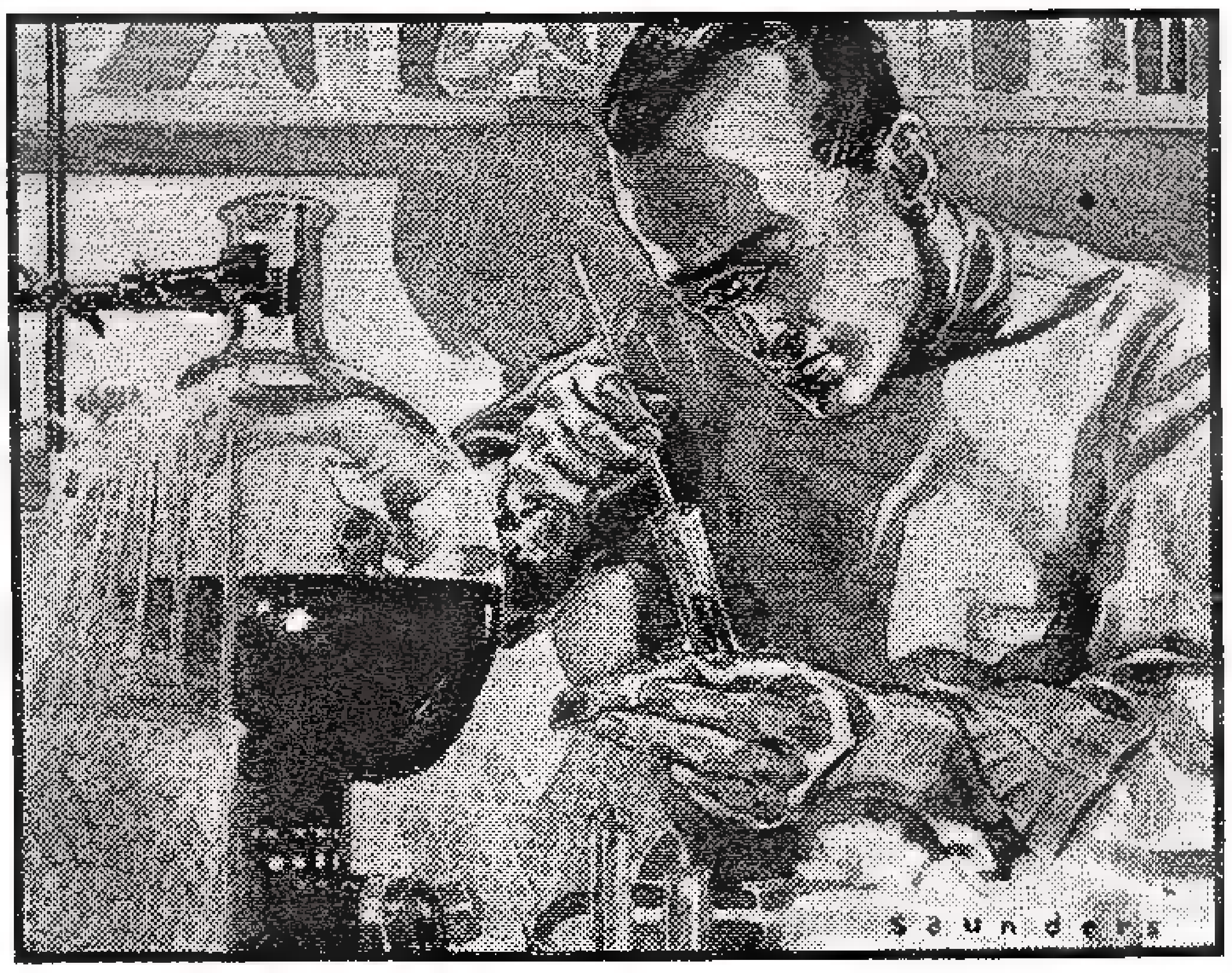
Although rabbits generally have a deep fear of all dogs, they seem to sense the affection of Bessie, and are happy with her.

Bessie, a thoroughbred Alsatian, having no puppies of her own, plays mother to this tame rabbit bought for her.

Man of Future to Have One Eye

MAN'S eyes will come closer and closer together, the bridge of the nose will further diminish, and finally the two eyes will again become one—just one large, cyclopean eye in the center of the face—if the predictions of Dr. Thomas Shastid of Duluth, Minnesota, come true.

Dr. Shastid, eye specialist and editor of many optical magazines, bases his predictions upon his years of study of the eyes of humans, of animals, and of fish.



Artist's drawing of the face of the future, having one powerful eye in the center of the face. Left eye of today will gradually shrink away; right will be cyclopean.

The left eye is being used less and less today—and soon will not be needed. The new eye will have two spots of sharpest vision in each eye, just as many birds have today, to obtain stereoscopic vision.

Although the field of view will then be narrower than now, the eye will be exceedingly acute for colors, for motion, and for form. It will probably be able to perceive as light many forms of energy which now produce in human eyes no sort of impression.

Dr. Shastid found that the eyes of birds are the best on earth, and are sometimes 100 times as good as those of man. They can not see blues or violets at all, but can see infra-red radiations.

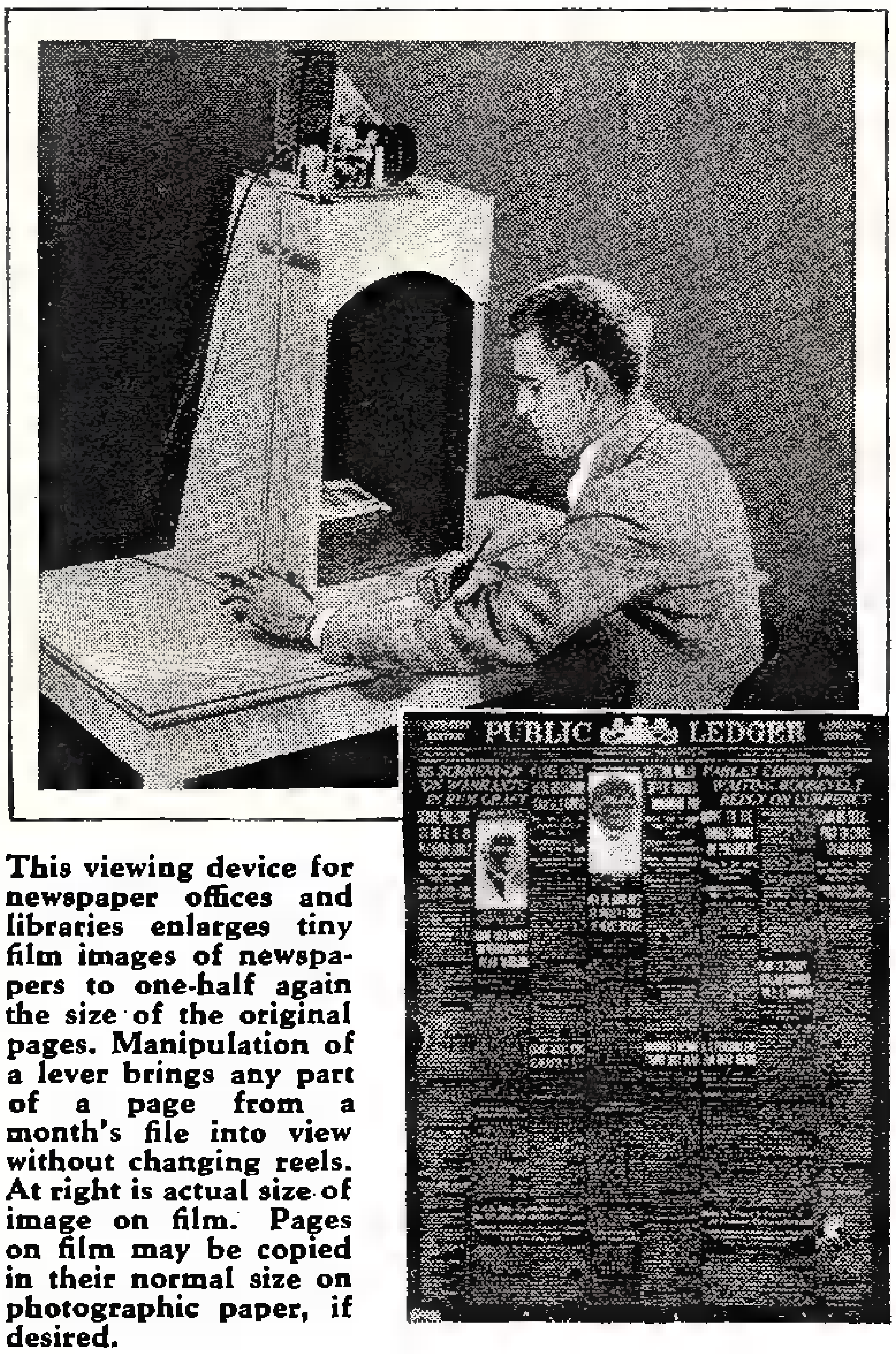
Horses can see almost nothing above their heads because the lower part of their eyes are practically blind. The upper part gives off a bluish sparkle, however, which enables the horse to travel well in the dark.

1500 Newspaper Pages Preserved on a Single Roll of Film

NEWSPAPER files may be permanently preserved on photographic safety film, eliminating entirely the need for using valuable space in libraries for storing old newspapers, and overcoming the problem of deterioration of newsprint paper. This new process was exhibited at a librarian's convention in Chicago by an eastern camera manufacturing firm.

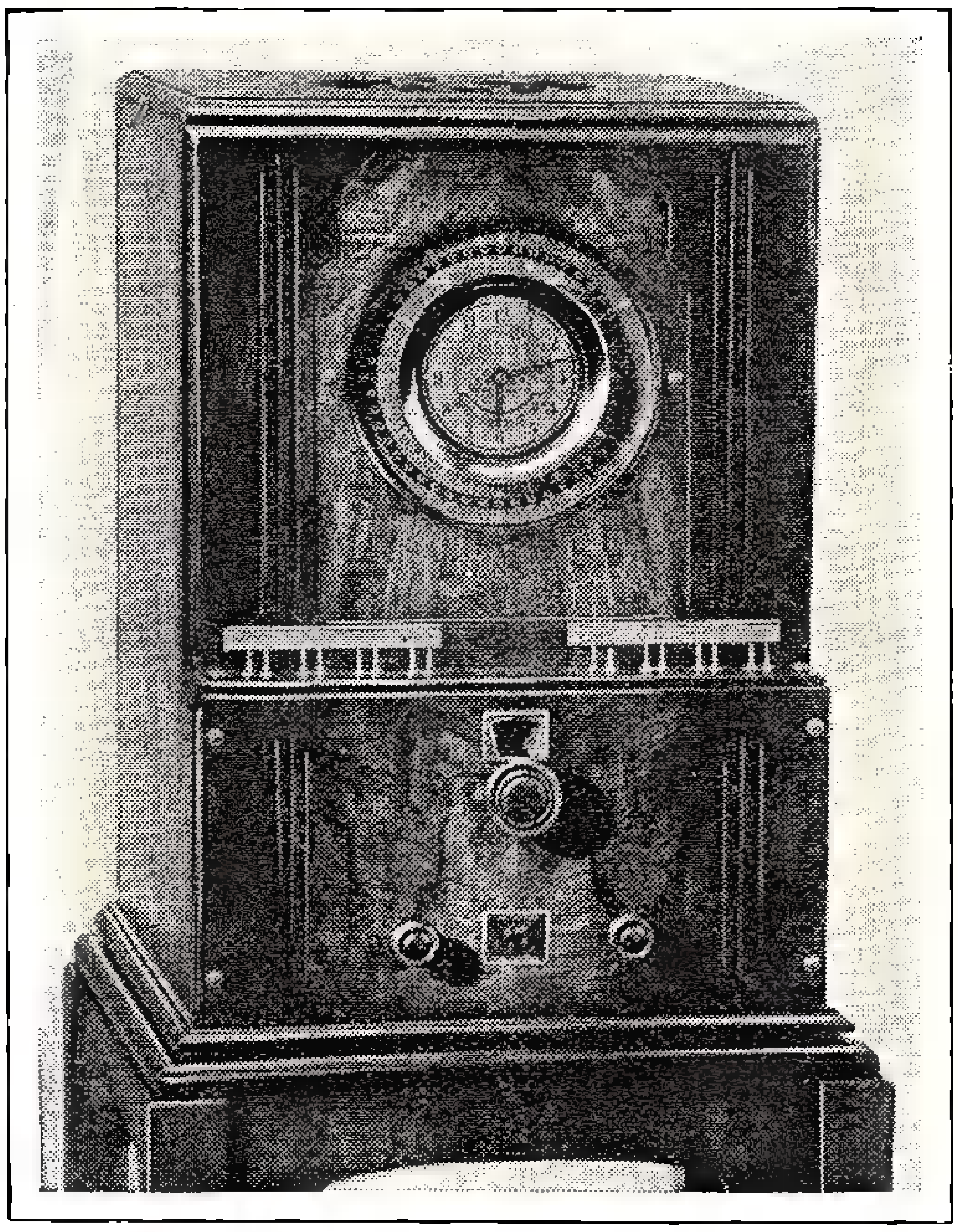
A viewing device used with the film enlarges the tiny page images on the film up to a screen image even larger than the original newspaper page size.

Any part of any page in a month's issues of a 50 page daily newspaper, stored on one reel of film, can be brought into view by manipulation of a lever on the viewing device.



This viewing device for newspaper offices and libraries enlarges tiny film images of newspapers to one-half again the size of the original pages. Manipulation of a lever brings any part of a page from a month's file into view without changing reels. At right is actual size of image on film. Pages on film may be copied in their normal size on photographic paper, if desired.

Radio Changes Programs Itself



Automatic station selector equipment in this radio may be set to turn on or off any of 8 different programs at 15 minute intervals, and to turn off radio at any given time.

A RADIO which thinks for itself, automatically turning on the best programs for any twelve-hour period, is the latest achievement of radio manufacturers. The receiver may be set to automatically change to any of eight different programs each 15 minutes, and to shut off at any desired time.

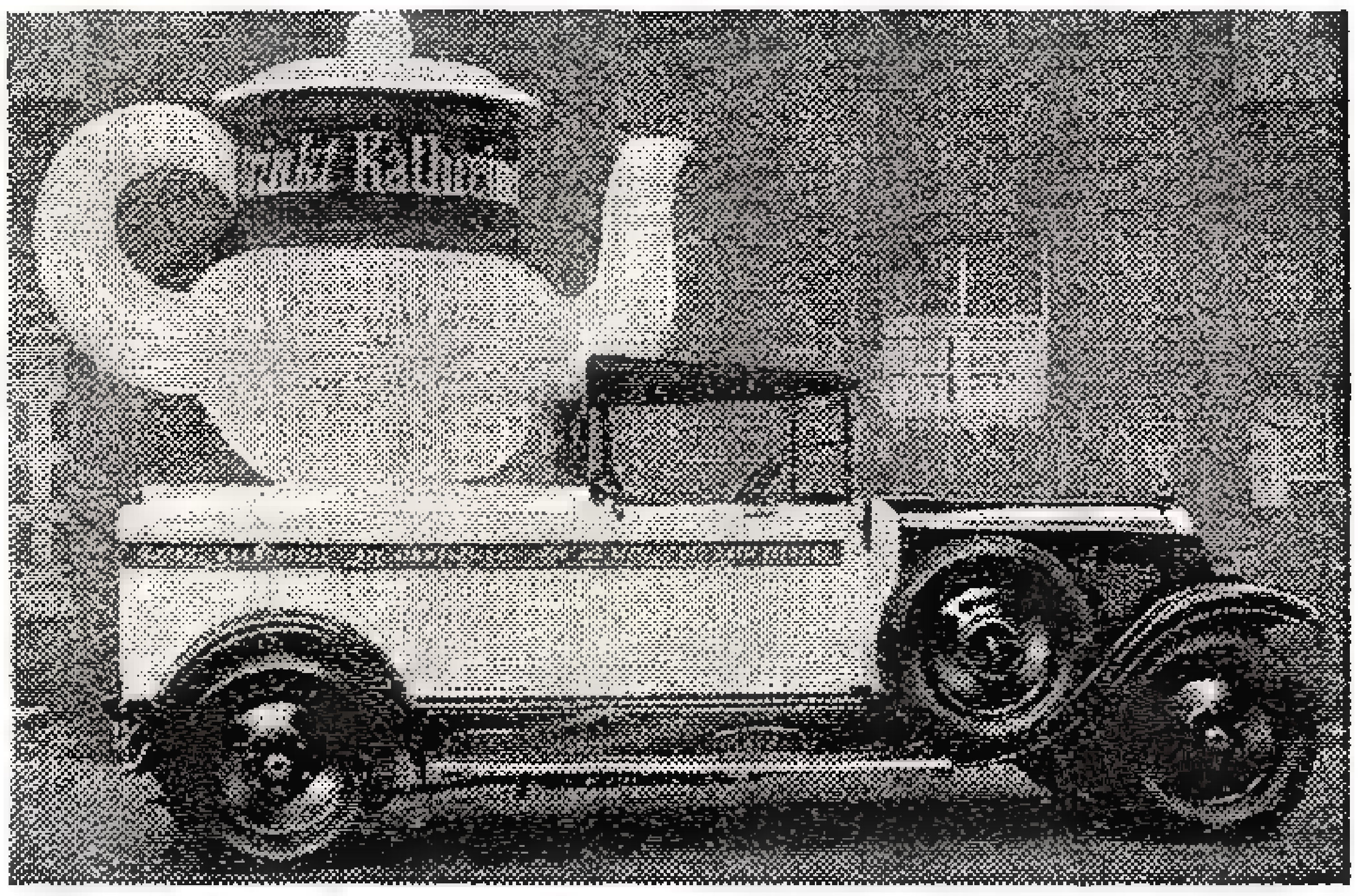
Switchboard plugs for the eight stations fit into any of 48 holes spaced at 15 minute intervals around the face of a built-in electric clock. With one cord plugged in at a certain time the radio will come on at that time, and continue to run on that program until the time at which the shut-off plug is located. Other station plugs are inserted wherever a change of program is desired.

Coffee Pot on Truck Sings, Speaks

A HUGE coffee pot mounted on an advertising car of a Berlin coffee retailer sings and blares forth the qualities of a certain brand of coffee.

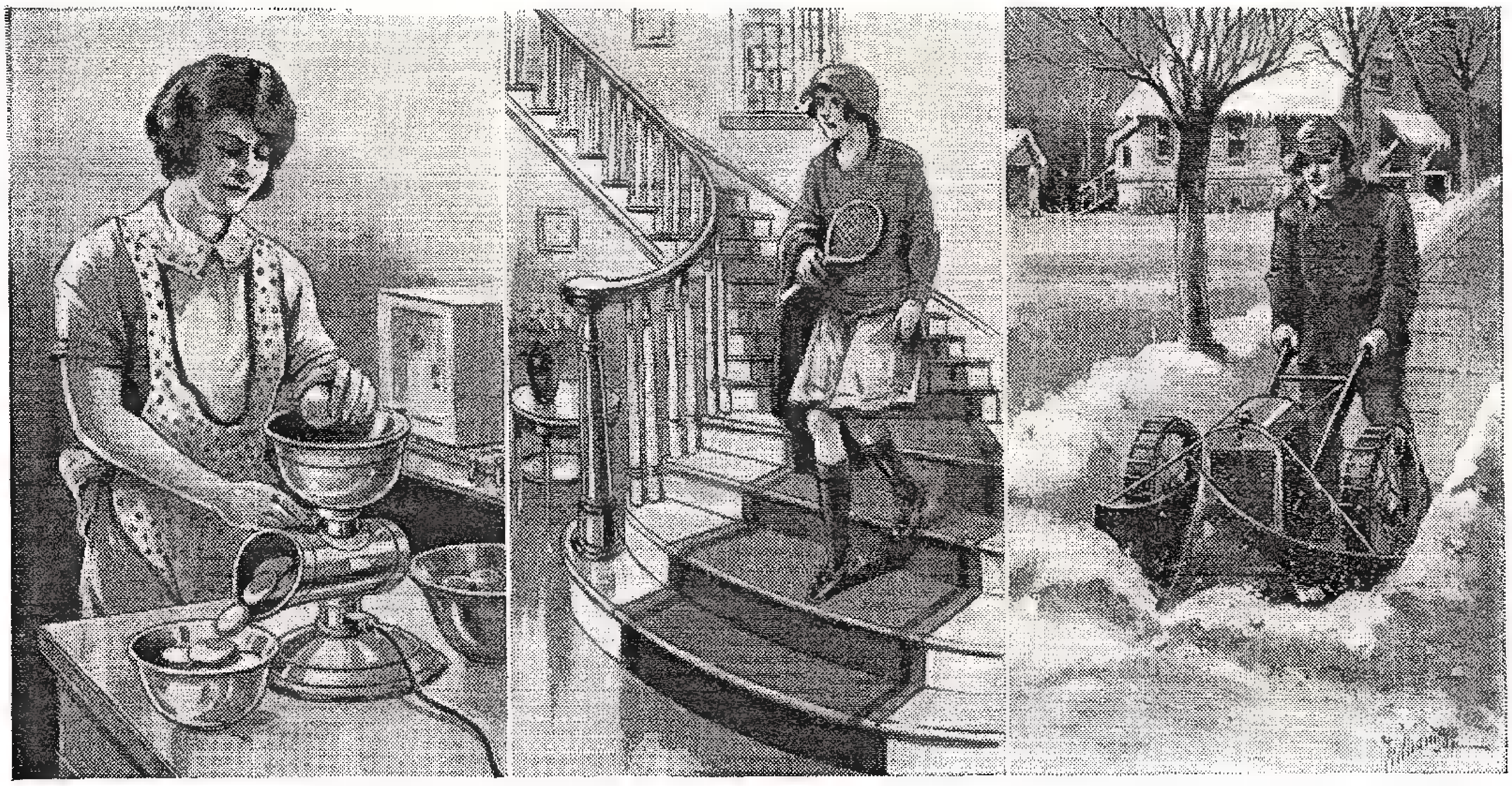
A microphone, amplier, and loudspeaker inside the pot make it possible to broadcast music or speech as the odd car moves through the streets. The lid of the pot raises when the loudspeaker is used.

The car has attracted a great deal of attention on the streets of Berlin, and has boosted coffee sales.



This huge coffee pot mounted on a truck has a lid which raises up to blare forth music or advertising messages of a Berlin, Germany, coffee retailer as the car moves about.

NEEDED INVENTIONS



A vegetable slicer that can be used on any vegetable and which will not cost more than fifty cents will reap a fortune. Likewise there is needed a new way to fasten carpets to stairways, and we need a new kind of snow plow for homes.

INVENTIONS beget inventions; one new and great invention often makes necessary a thousand or more independent inventions. The electric icebox is an example. It should be borne in mind, too, that the electric icebox still has many inventions coming to it before it can be looked upon as a perfect device. Right now the manufacturers of electric iceboxes are sending out an SOS signal for a new and better way of opening icebox doors. When things are put away, the housewife often has her hands full and some sort of trip must be had to open the door that can be manipulated without the hands; preferably with the foot. A photo-electric cell has been suggested for the purpose, but I, for one, would warn my readers against perfecting such a thing for purely commercial reasons. True, it would work beautifully but at the same time it would add so much to the price of a refrigerator that it would interfere with sales. The trick should be done by purely mechanical means. Think this out and you make yourself $100,000 as easy as falling off a log.

Vegetable Slicer

Can you invent a 50 cent device for the kitchen that will slice vegetables? The housewife puts in a carrot, turns the crank and out comes sliced carrots, fast and furious, one thin slice for every turn. The same should be the case with potatoes, 'cumbers, etc. Don't forget, in designing this contraption, that a little set screw should be included that would make it possible for the operator to adjust the thickness of the slices. Keep in mind also the fact that the thing would sell quickly to a manufacturer if it were made almost entirely of pressed metal. There is a potential market for 5,000,000 such articles and they should bring five cents apiece royalty. If you are good at figures, dope the reward out and get busy.

A Window Within a Window

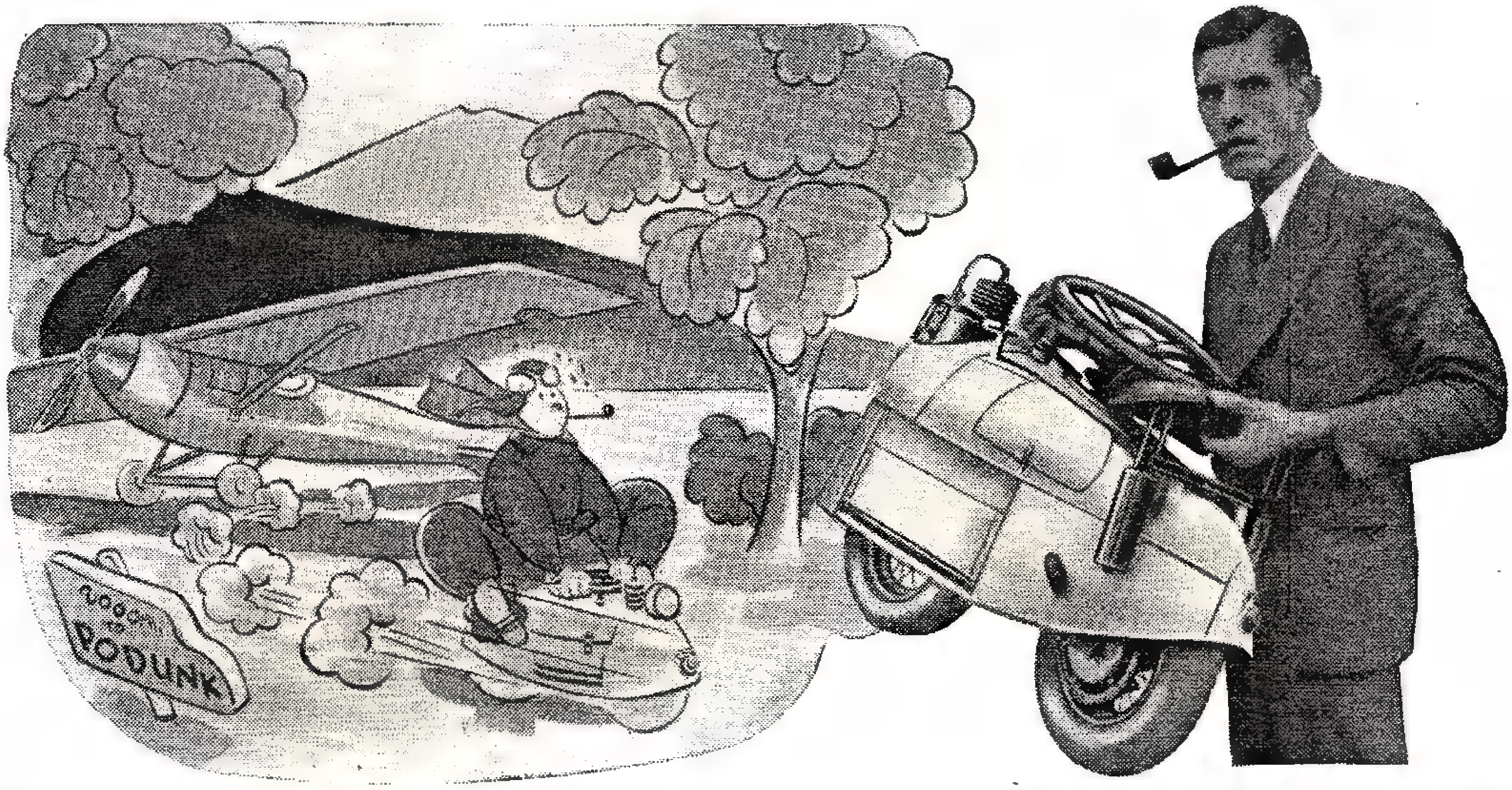
The storm window has been with us for many years and it has become so commonplace that it has escaped the attention of inventors. Yet it is an inconvenient device if ever there was one. Once in place, it must be held open by devices that give trouble when the wind blows and through which many windows have been torn from their moorings. What is needed is a window within a window, so to speak; a window that can be adjusted perfectly so that the occupant of a bedroom may adjust the supply of fresh air to a nicety. This added feature should not cost over fifty cents and don't think that the wooden slides now used solve the problem for people who want to sleep in cold rooms. What is needed is either a much better way of opening storm windows or a feature built right into the storm window whereby various openings may be arranged, preferably without draft. There should be about twenty new one thousand dollar bills waiting for such a thing.

Slip-proof Method of Holding Stair Treads

Will the man who can attach treads to stair cases without the use of tacks, brads or cement please raise his hand? What is

(Continued on page 142)

Plane Forced Down; Pilot Scoots Away on Tiny Motorcycle



This tiny motorcycle, carried along in an airplane, eliminates walking home after a forced landing. Although weighing but ninety pounds, the one-cylinder engine will make 35 m.p.h. and run 110 miles on a gallon of gasoline.

ALEX BRUN, Cincinnati aviator, became tired of walking back home after frequent forced landings, and designed a tiny motorcycle which he now carries along in his plane.

The midget cycle is only 36 inches long, weighs 90 pounds, and travels at a speed of 35 miles per hour. The powerful one cylinder motor will travel 110 miles on one gallon of gas.

Steering wheel and controls are much like those found on automobiles. A streamlined body adds to its speed and provides a comfortable seat for the rider. Projections on the body are used as foot rests.

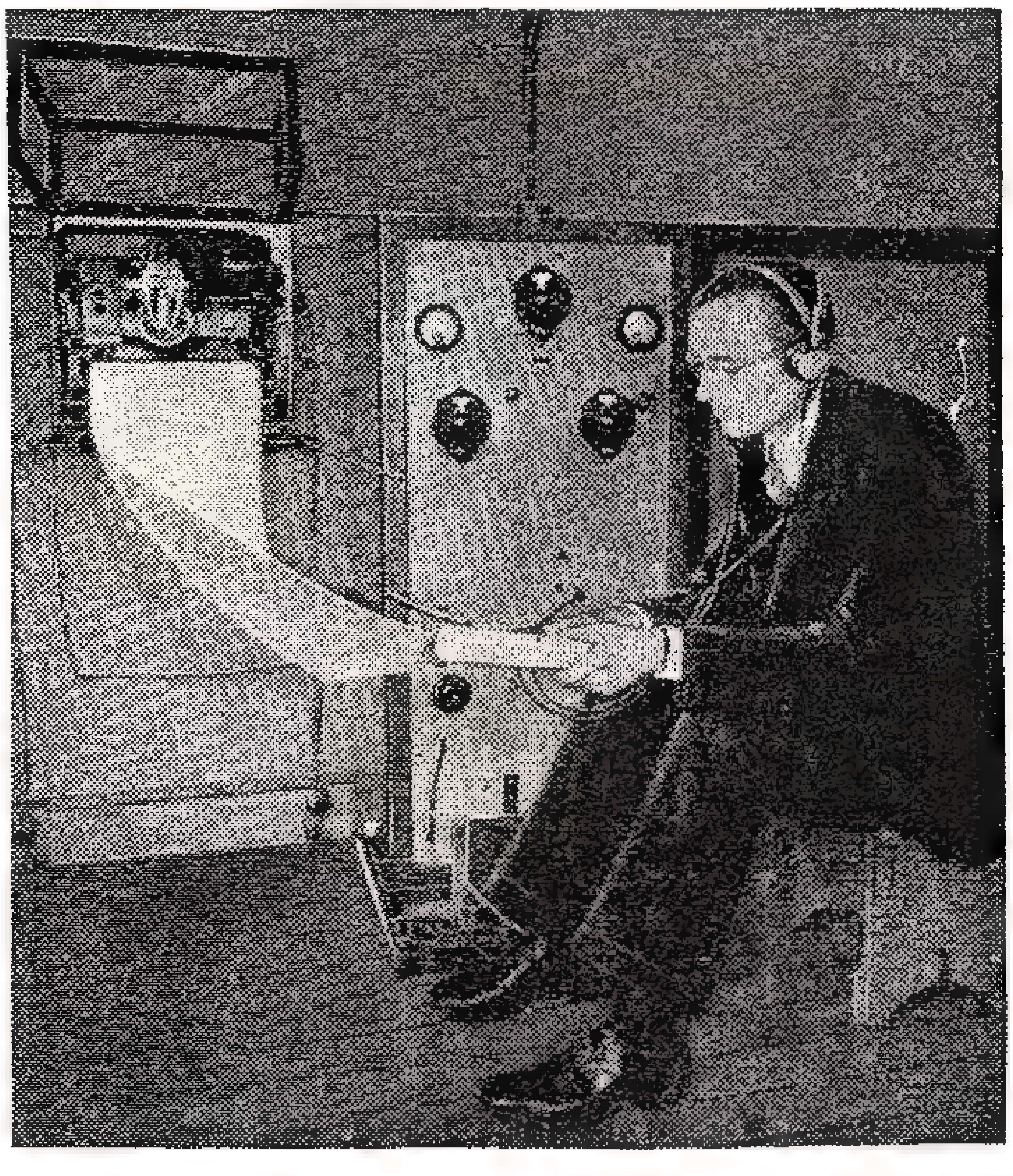
28 of Tiniest Books Fill Thimble

THE publication and binding in leather of what is said to be the smallest book in the world has been completed by H. B. Woods and F. Vroom of Worcester, Massachusetts. The tiny volume contains 28 pages of verse by the Persian poet, Omar Khayyam.

The book in its final bound form is 3/16" x ⅜", less than half the size of a postage stamp. Twenty-eight of the volumes will easily fit into an ordinary thimble. A magnifying glass must be used for reading the tiny but clean-cut printing of the book.

28 volumes of the smallest published book in the world can be packed into the ordinary thimble shown above.

Radio Signals From the Stars

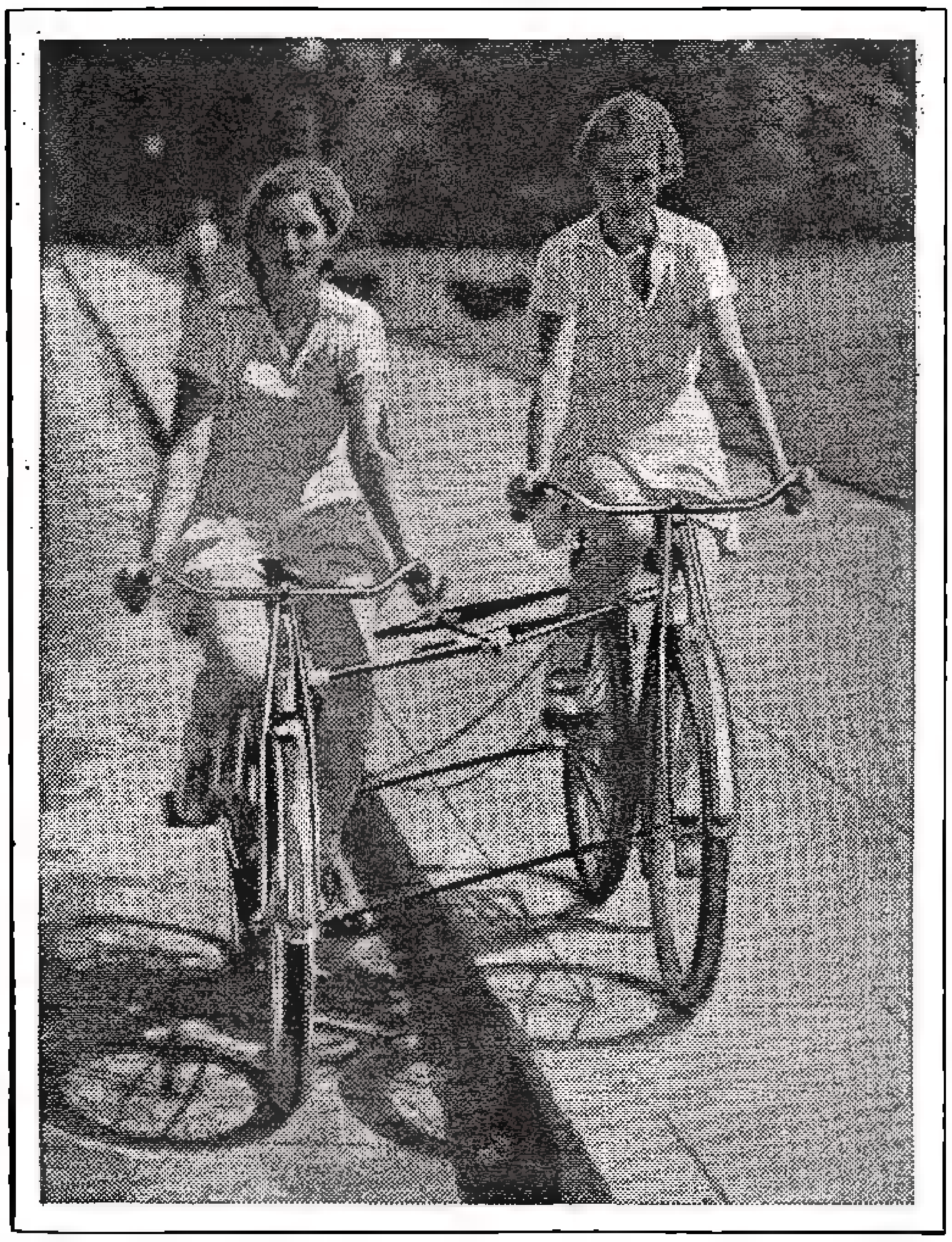


Karl Jansky is shown at one of the instruments which he used to receive short wave radio impulses from the center of the Milky Way. He can give no explanation of the signals.

RADIO signals have been received from stars in the Milky Way by Karl G. Jansky of the Bell Research laboratories. The signals, which come in as a sizzling sound—like bacon in a frying pan—come in on a wave length of about 15 meters. They were heard in greatest volume from the constellation Sagittarius in the center of the Milky Way.

The signals, being continuous, could hardly be interpreted as messages from people on other planets.

Ride Side by Side on This New "Bicycle Built for Two"



This "bicycle built for two" is made up of two ordinary cycles joined together by a steel framework and universal joints. Note that riders may be at different levels.

THE "bicycle built for two" of the gay nineties may become popular again. A device invented by Charles Nessom of St. Louis allows two ordinary bicycles to be coupled together so that riders can sit side by side and enjoy the ride together.

The light steel framework contains universal joints, so the two front wheels can be steered as one. Cross chains at the rear may be loosened to allow the two riders to pedal together at different elevations without danger of tipping.

Coaster brakes allow the boy friend to do all the pedalling if he wishes, while his girl enjoys the scenery. If perchance a quarrel should develop, the bicycles may be separated in a minute, and no one will have to "walk home from the buggy ride."

The inventor claims the device represents the first practical improvement on the twin bicycle in forty years.

Air Mattress Is Floating Bed

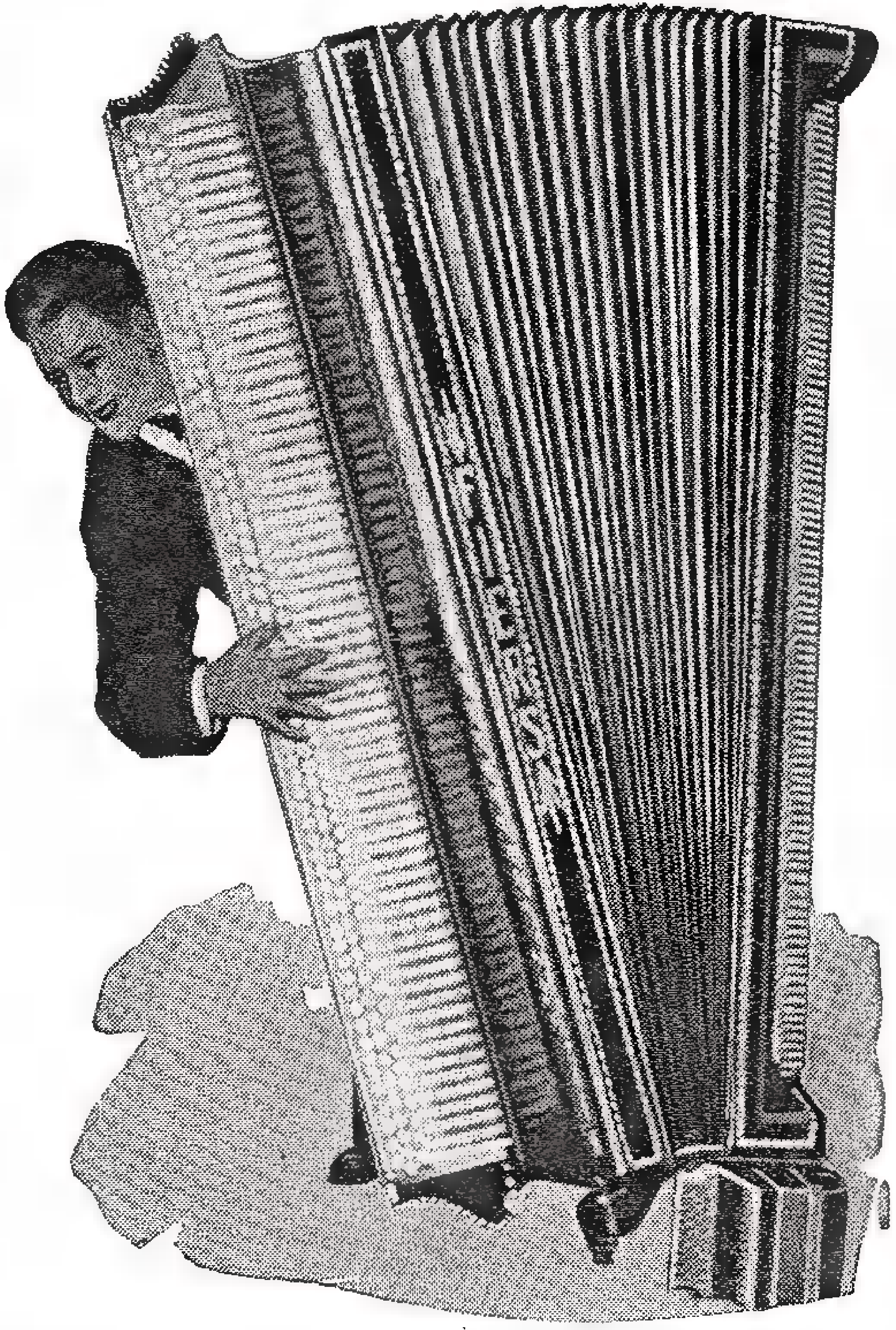
AN AIR mattress which can do double duty, both on land and water, is one of the latest innovations at Lake Wannsee, a Berlin resort.

Inflated rubber compartments covered with cloth make this a soft, comfortable mattress for the bed. On water it will easily support two people, and afford an ideal resting place after a swim. It has a built-in pillow, so that the head is always higher than the rest of the body.

With this rubber raft bathers can paddle far out on the water for their sun baths, or just float along with the wind—and dream.

Float along with the waves and dream—bask in the sun after a swim—or frolic about as if on a magic floating carpet, with this air mattress made for land or water.

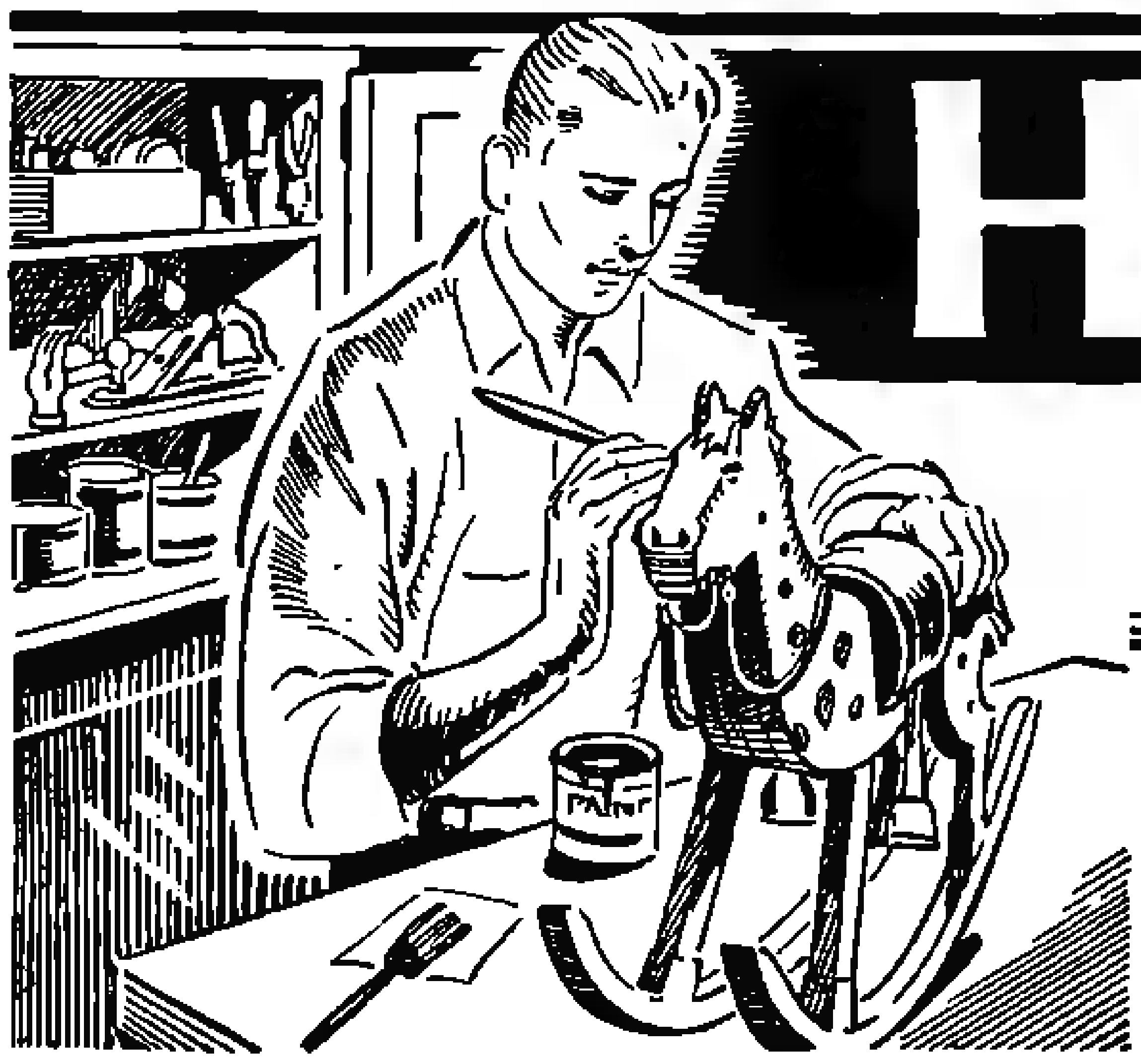
Largest Accordion Is Like Organ



Jean Fiers, a Belgian musician, plays the world's largest accordion in a Paris circus. It has 1300 stops, weighs 176 lbs., and is 5½ ft. high. Below is a standard accordion.

THE world's largest accordion, played by Jean Fiers, clown musician of the Medrano Circus in Paris, sounds like a church organ when it is operated at full blast.

The huge instrument is 5½ feet high, and weighs 176 pounds. Playing it is not so easy, for there are 1,300 stops and a five foot piano keyboard. Musical effects from a violin squeak to a drum beat can be made.

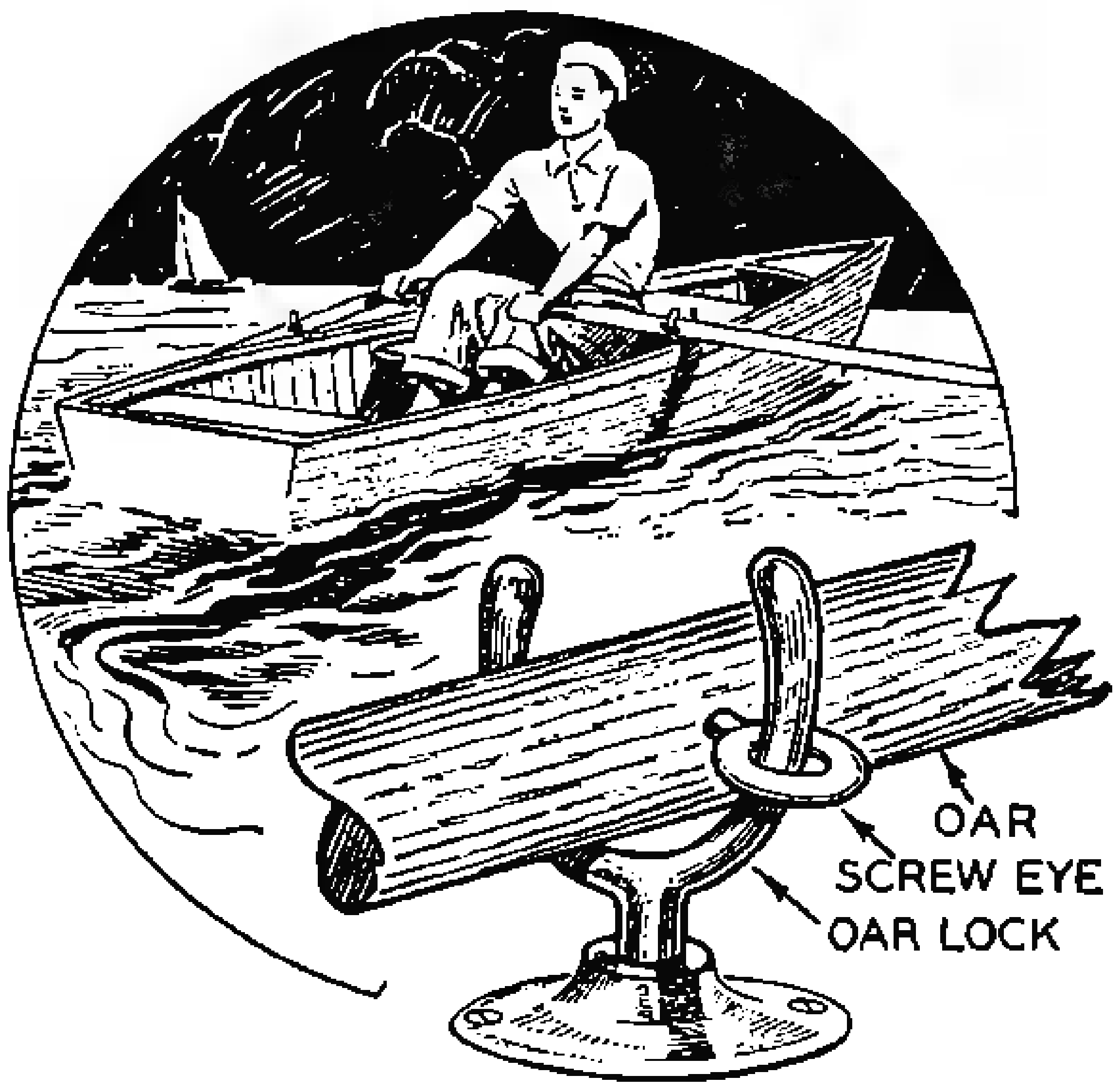


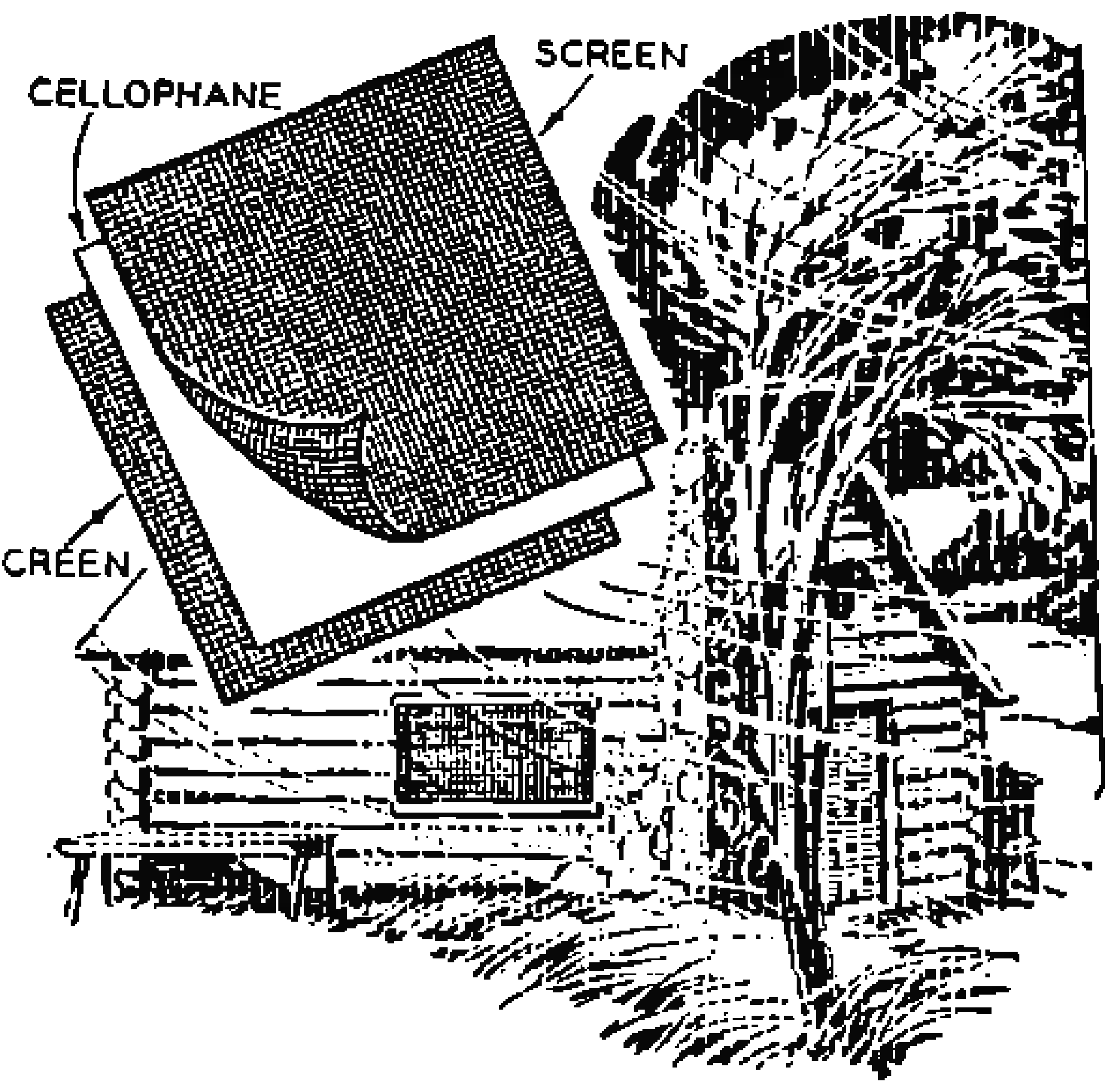
HANDIKINKS For Everybody

Here you'll find the newest way to do that baffling little household task that has had you stumped.

Screw Eyes Keep Boat Oars in Position

WHEN the leather guide on rowboat oars becomes worn so badly that the oars slide back and forth in the oarlocks, it is sometimes difficult to obtain the proper kind of new leathers. An ordinary screw eye with an opening of approximately one-half inch will serve admirably instead of the leather. Remove all leather and nails from the oar, and insert the screw eye as shown in the drawing. It may be necessary to drill a guide hole in the oar to prevent splitting.—John Hayes.



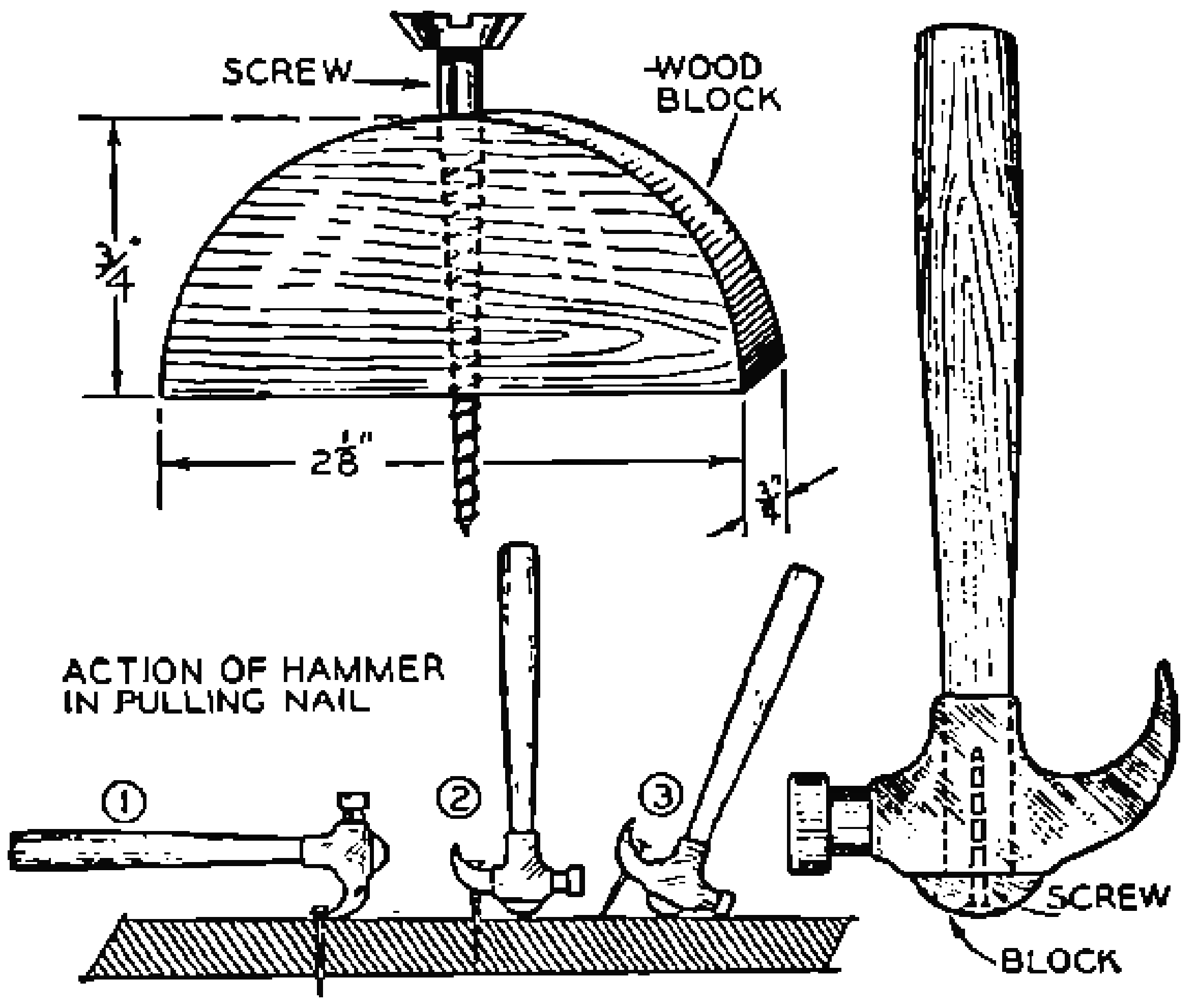


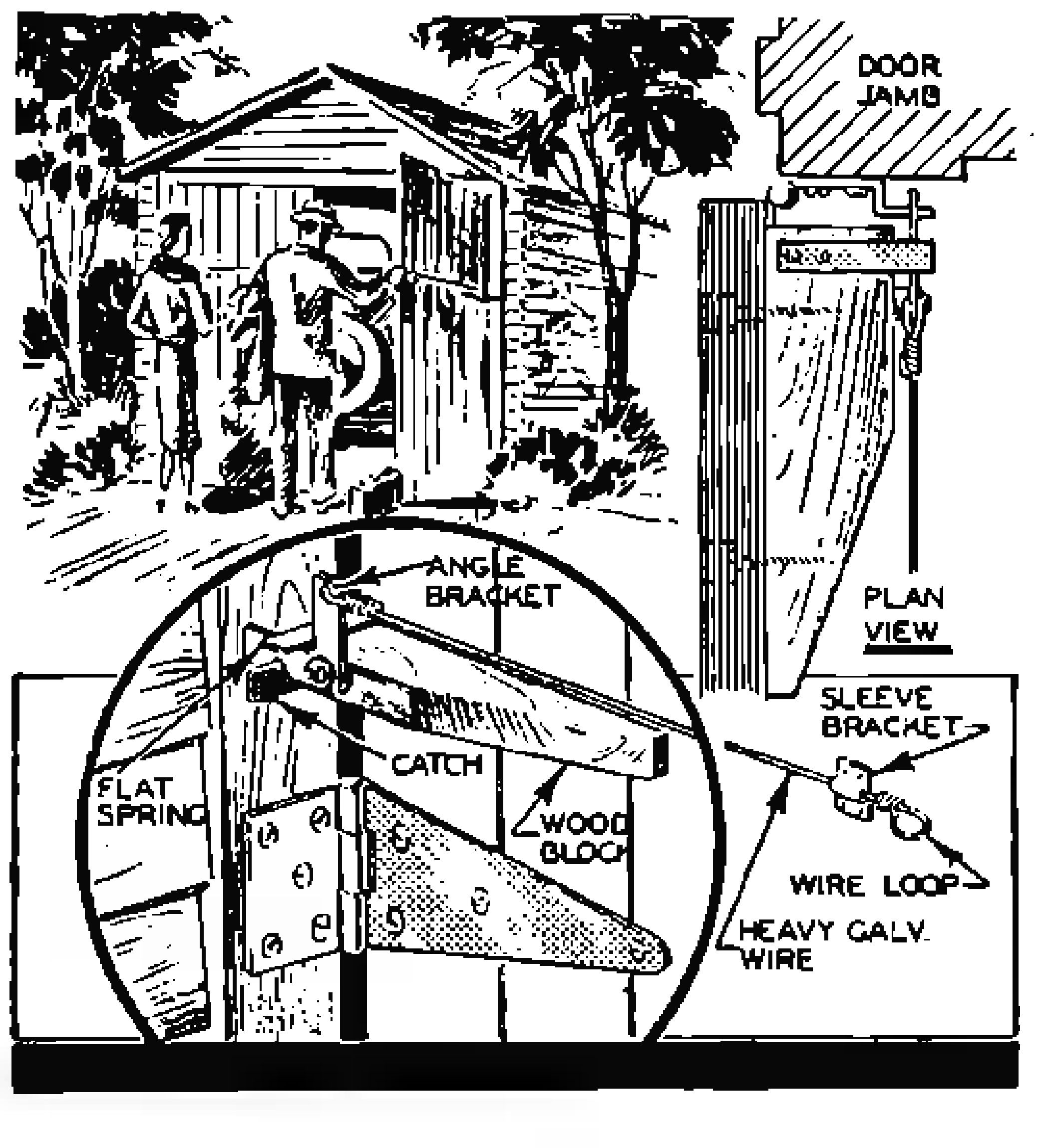
Sheet Cellophane Between Screens Makes Window

FOR that lake-shore cabin or cottage where glass windows are continually being broken while you are away, try this stunt. Get a large sheet of cellophane the size of your window, or enough small pieces which can be pasted together to make up the correct size. Cut two pieces of window screen to the size of the window being fitted, and place the cellophane between the screens. This combination may be tacked directly to the window frame, or to a wood frame.—M. J. Bolt.

Wood Knob Increases Leverage of Hammer

WITH the ordinary carpenter hammer it is oftentimes difficult to pull out longer nails without using wood blocks to raise hammer above surface of the board. Cut a semi-circular block of wood from a ¾ inch board as shown, and drill a hole just a little smaller than the diameter of a 1½ inch wood screw. Fasten block to hammer as shown. In pulling long nails leverage of hammer is automatically increased as the nail comes out of the board.—H. J. Norton.

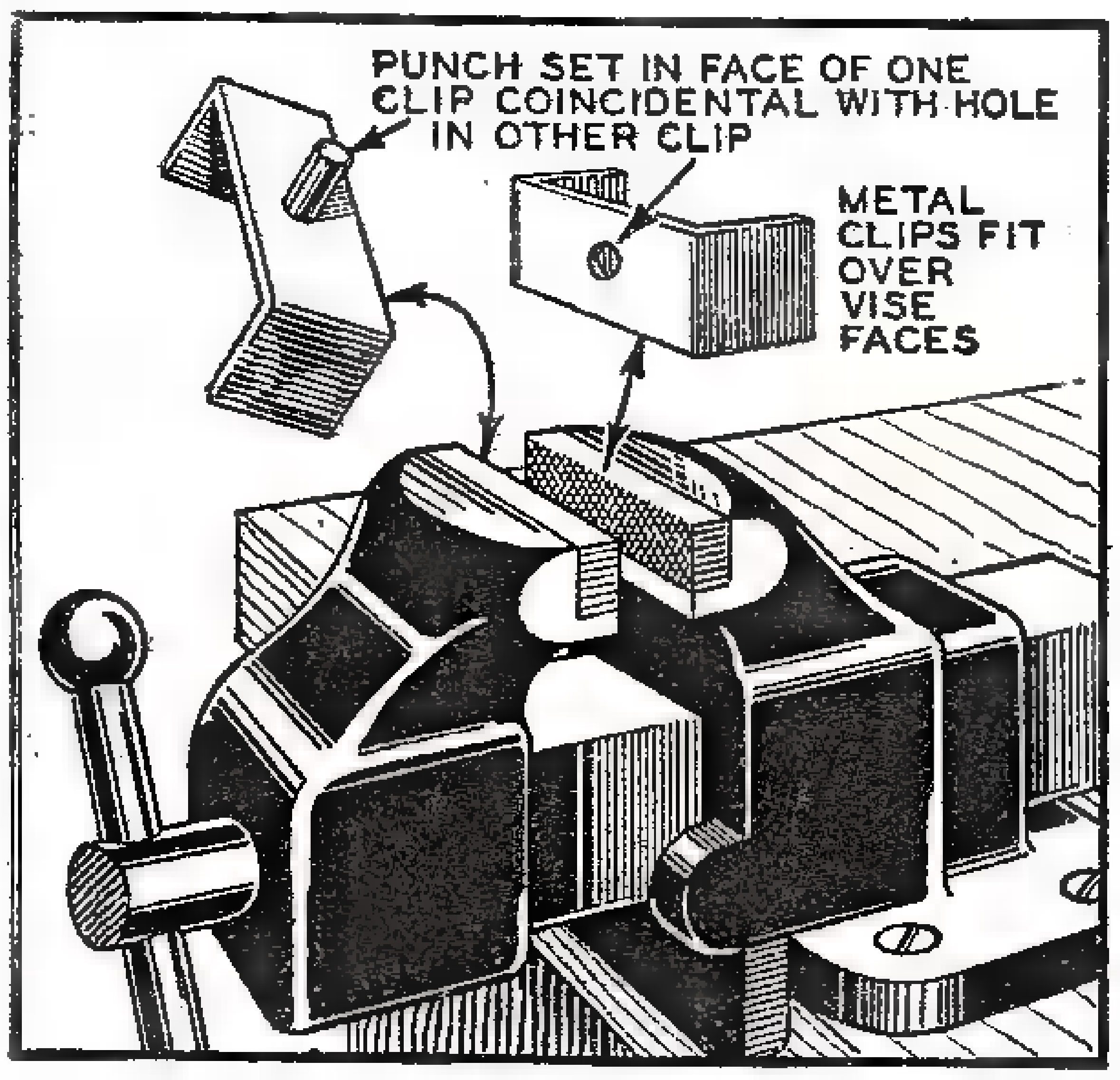




Catch Holds Garage Doors Open

THIS simple and easily made catch will hold your garage doors open, but may be instantly released without stooping or using your foot. An angle bracket is notched as shown to form the latch. A wood block of the shape shown in the plan view is screwed to the garage door at a height of four feet, close to the hinge side of the door. The latch is fastened to the block with a wood screw, tightening the screw just enough to allow free turning of the latch. A piece of stiff wire is threaded through a sleeve bracket or screw eye at the front of the door, and fastened through the upper hole in the latch. A piece of clock spring fastened to the side of the block continually presses the latch downward.—H. S. Ray.

Time-savers for the Garage Man

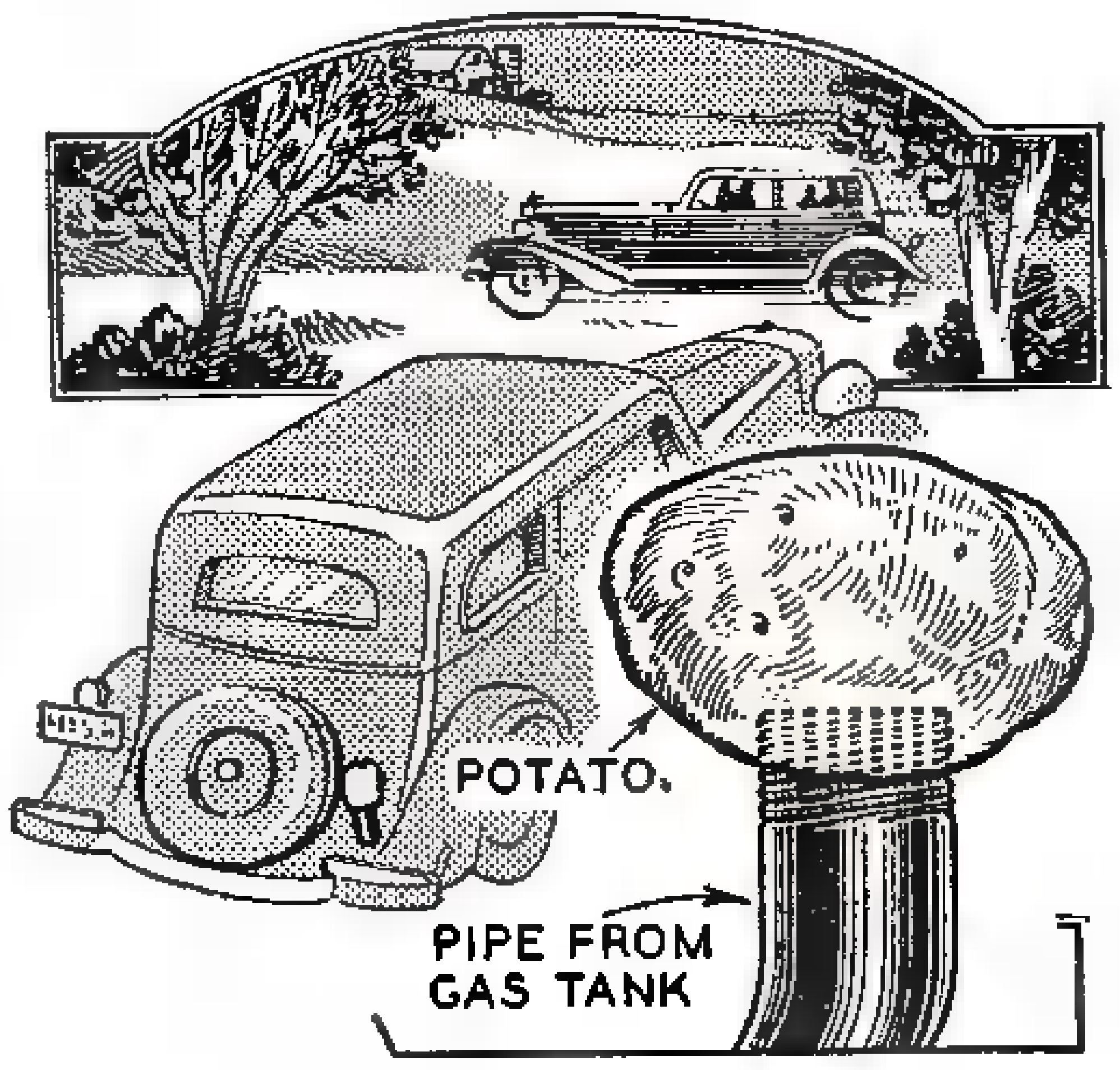

PUNCH SET IN FACE OF ONE CLIP COINCIDENTAL WITH HOLE IN OTHER CLIP
METAL CLIPS FIT OVER VISE FACES

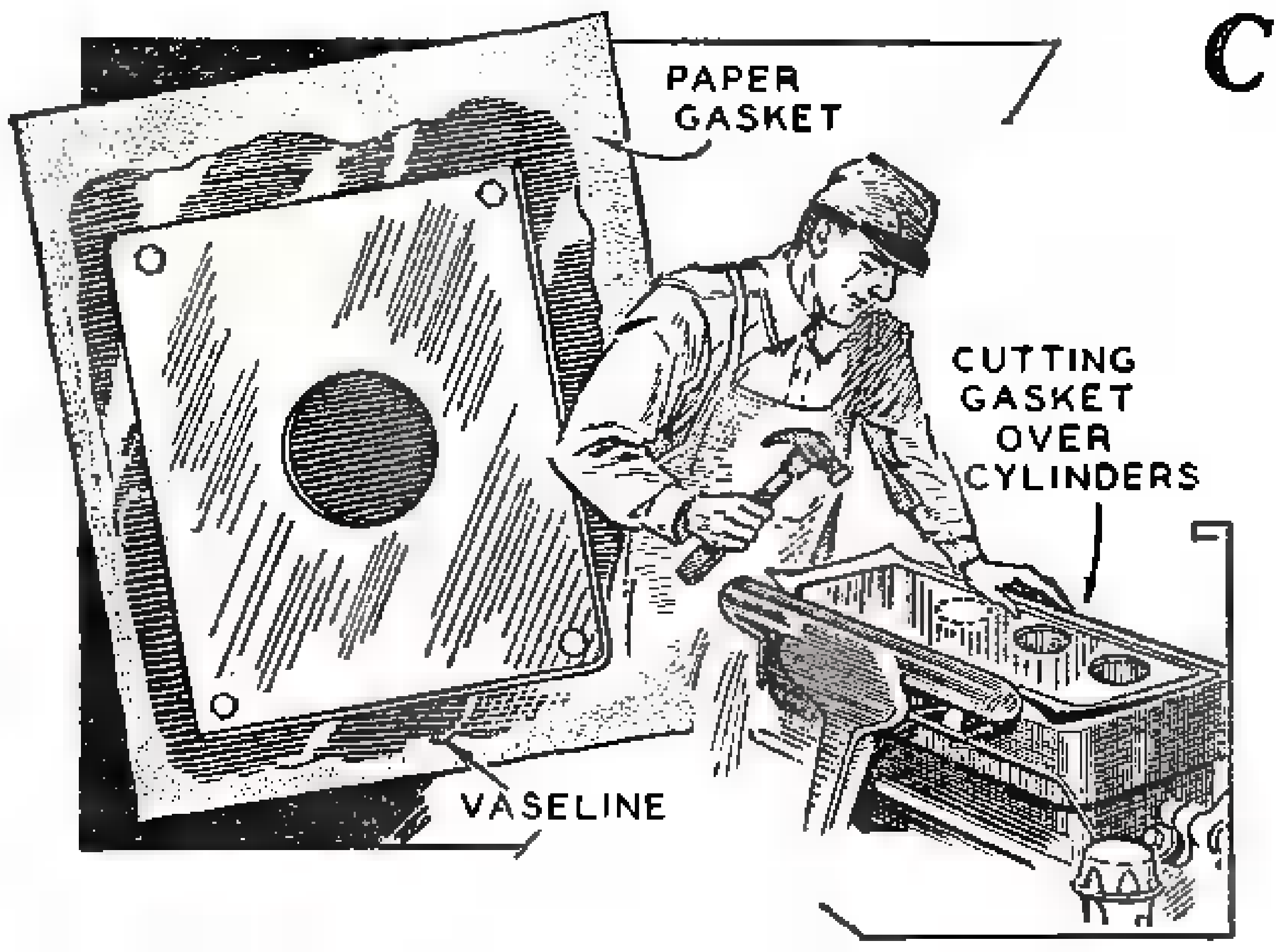
Bench Vise Makes Efficient Punch Press

IF YOU have need to make neatly punched holes in brass, copper, or other light sheet metal, and haven't a punch press available, your shop vise will do the trick. Bend two pieces of strap iron as shown to fit over the jaws of the vise. In the center of each clip drill a hole the size of the hole you wish to punch. Set a punch of hardened steel in one of the holes, making a fairly snug fit. The punch and hole will have to be perfectly in line—this can be done by placing a tiny ball-bearing between the clips at the center, and drawing up on the vise. The impression of the ball will then serve as a guide in drilling the holes. If this punch is to be used for heavy work, a good grade of steel should be used for both the punch and the die.—S. J. Brown.

Large Potato Will Serve as a Gas Tank Cover

IF YOU ever should drive into a filling station for gas, and the attendant forgets to replace the gas tank cap, chances are a lot of gas will splash out before the cap can be replaced. A large potato will serve nicely for an emergency cap, for it only has to be pressed tightly down over the opening of the gas tank. Carry the potato along with your car tools if you will, or get one from some nearby potato patch whenever you happen to need it. This repair is only temporary, of course.—Roy J. Adams.



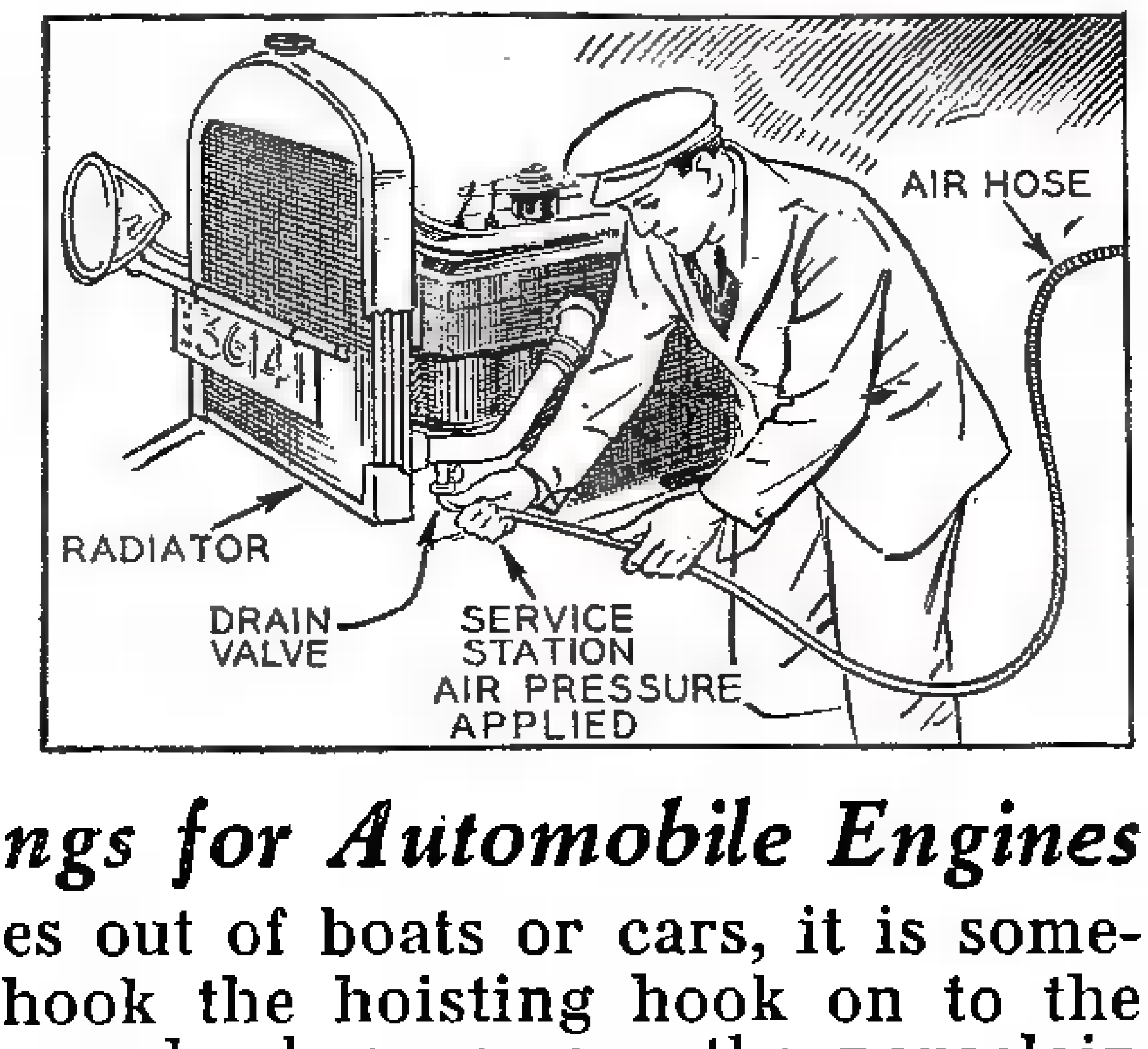


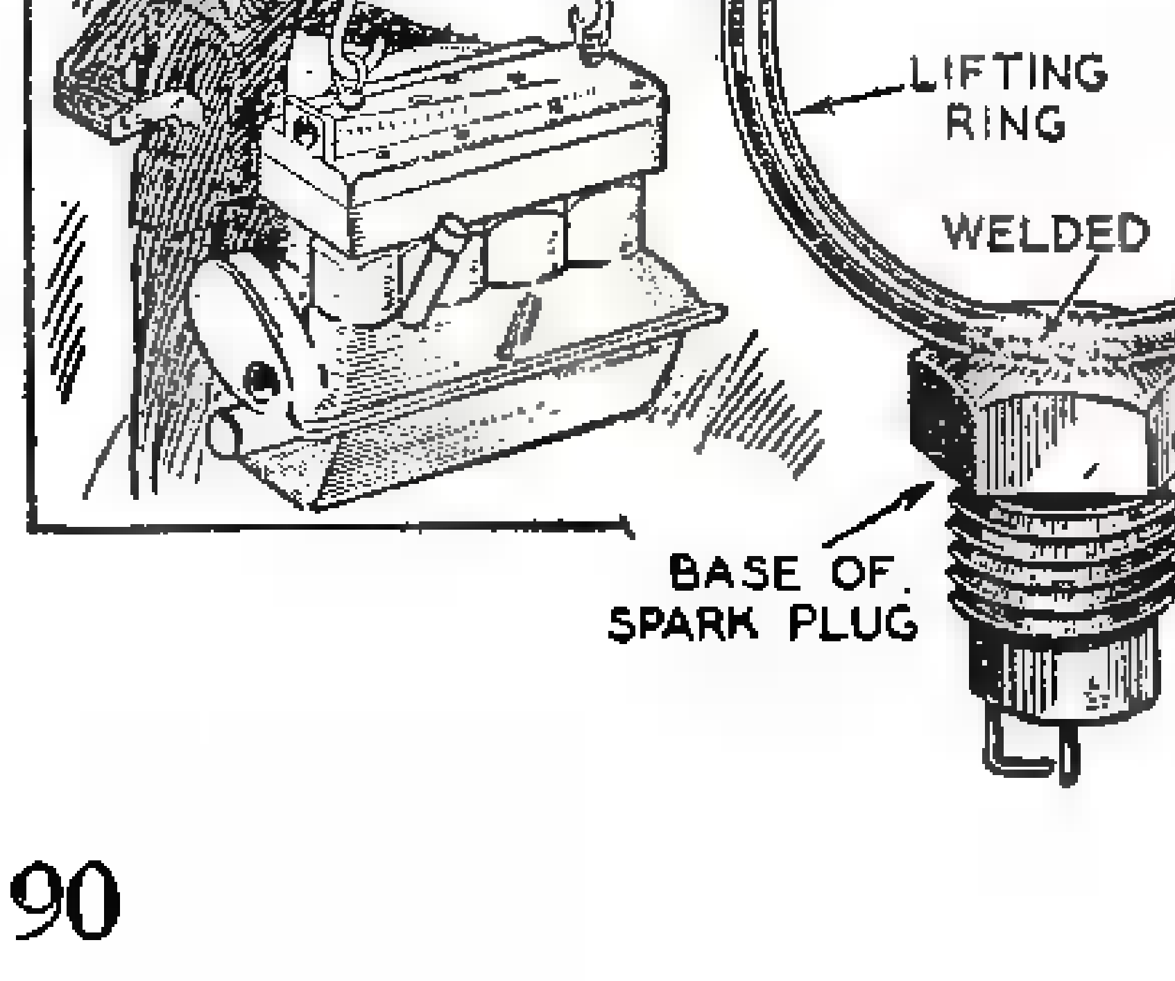
Cutting Car Gaskets With Hammer

CUTTING gaskets from sheets of paper or cork is never an easy job, and generally much fitting must be done before a good gasket can be obtained. Here's a simple method by which the gasket can be cut exactly. Smear vaseline or hard oil over the metal to hold the sheet of gasket material down, punch out the bolt holes and insert the bolts to prevent the sheet from moving. Now take an ordinary hammer or a wooden mallet and pound the edges of the metal to cut off the gasket to the exact size.—Len Cooke.

Compressed Air Cleans Clogged Radiator

HERE'S an effective remedy for that clogged radiator. Drive to any service station, and while the radiator cap is still in place, open the petcock at the bottom and quickly press the air hose against it, just as you would do with a tire valve. Let the pressure mount up to 30 or 35 pounds, repeating the operation several times. This shoots the water backwards all through the radiator, cleaning out any clogged tubes. Be careful not to use excessive pressure, for it may blow apart the radiator seams.—Buzz Burton.


36141
AIR HOSE
RADIATOR
DRAIN VALVE
SERVICE STATION AIR PRESSURE APPLIED



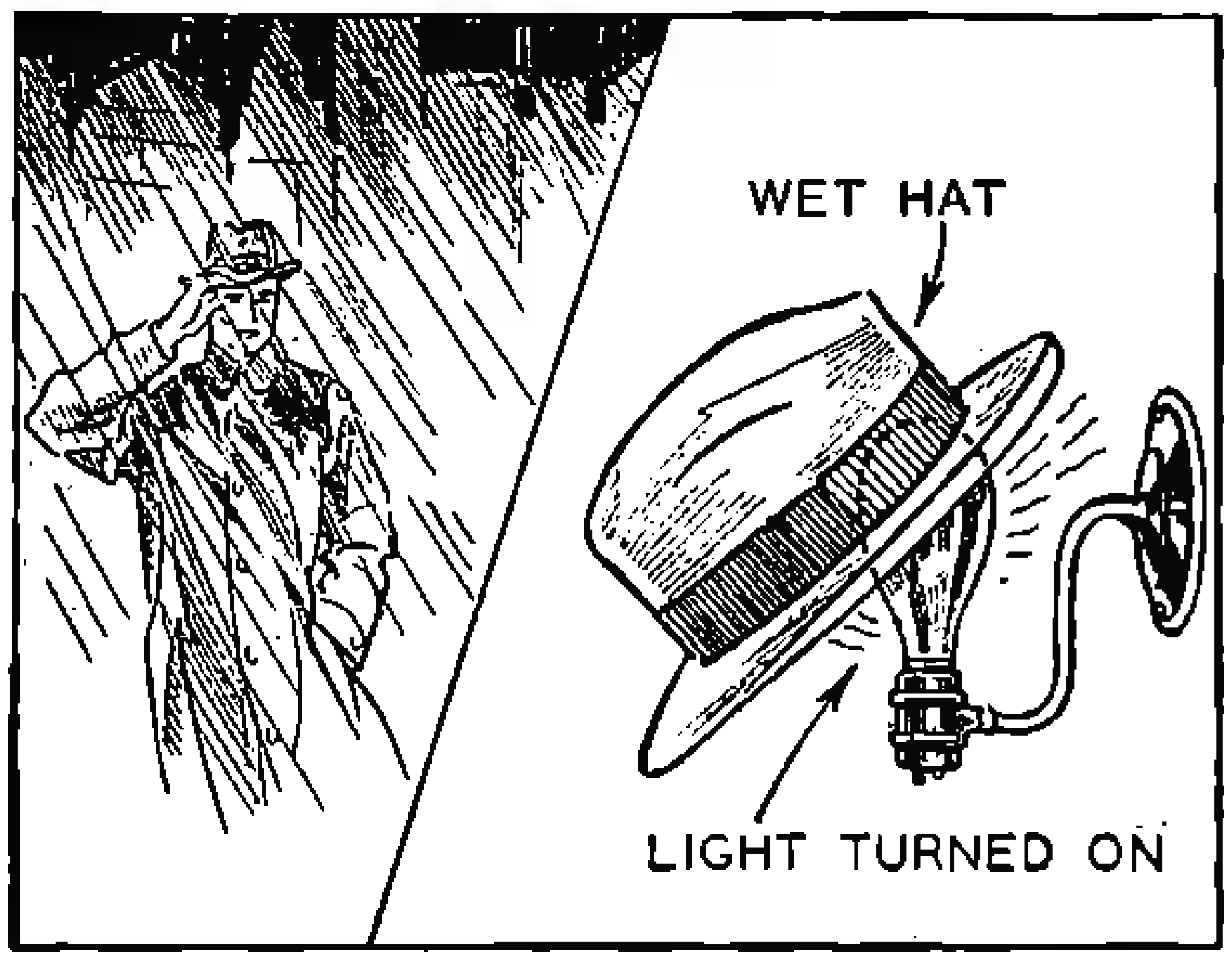
Handy Lifting Rings for Automobile Engines

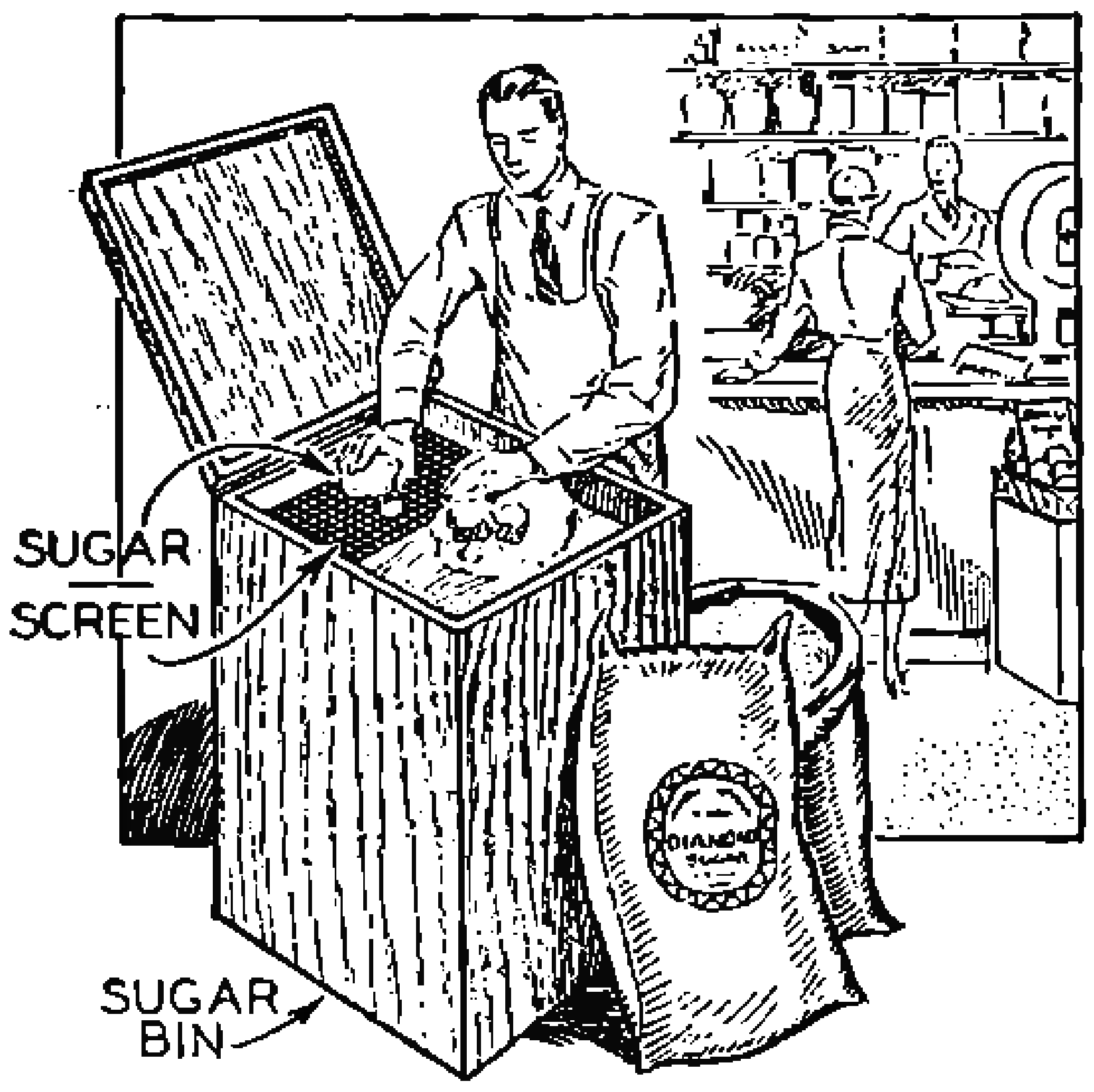
WHEN lifting engines out of boats or cars, it is sometimes difficult to hook the hoisting hook on to the engine. Take an old spark plug, remove the porcelain core, and weld a steel ring to the upper part as shown. The lifting ring may then be screwed into the spark plug holes of the engine. For heavier engines two of these rings, one at each end, may be necessary for proper balance. A long quarter-inch bolt bent into a circle, with the threaded part extending through the plug base, and a nut screwed up tight beneath, will give the same results, where welding equipment is not available.—W. J. Brown.

Little Helps for the Housewife

Electric Bulb Dries Wet Hat Quickly

HERE'S a handy tip for men who are caught in a rain without an umbrella, and come home with a hat full of water. Remove the shade from any electric light fixture which has a bulb in a vertical position, with the socket down. Shake off as much water as you can from the hat, and carefully press it back to its proper shape. Hang the hat over the bulb and turn on the light. The heat from the bulb will force all moisture from the hat.—Maurice Lonn.



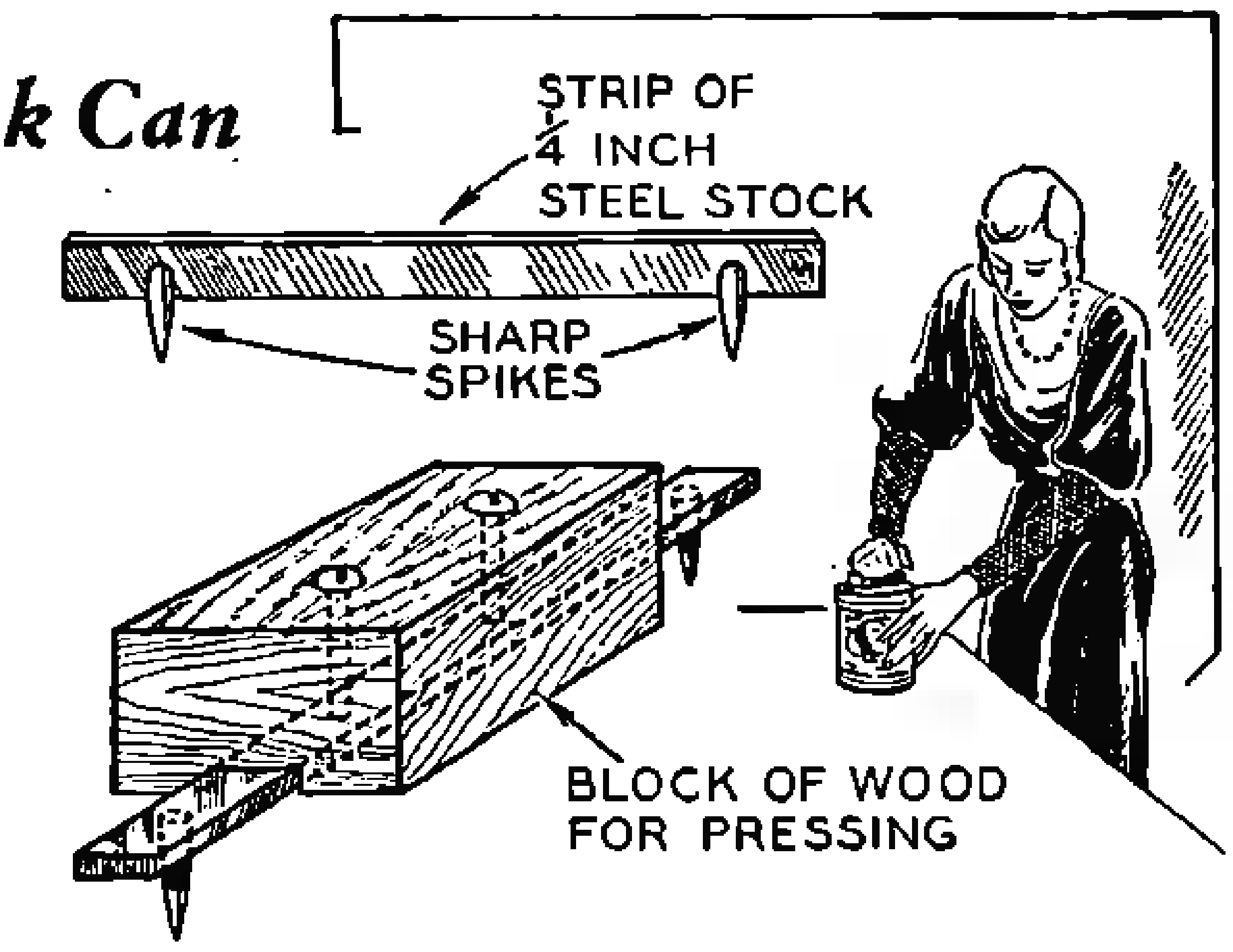


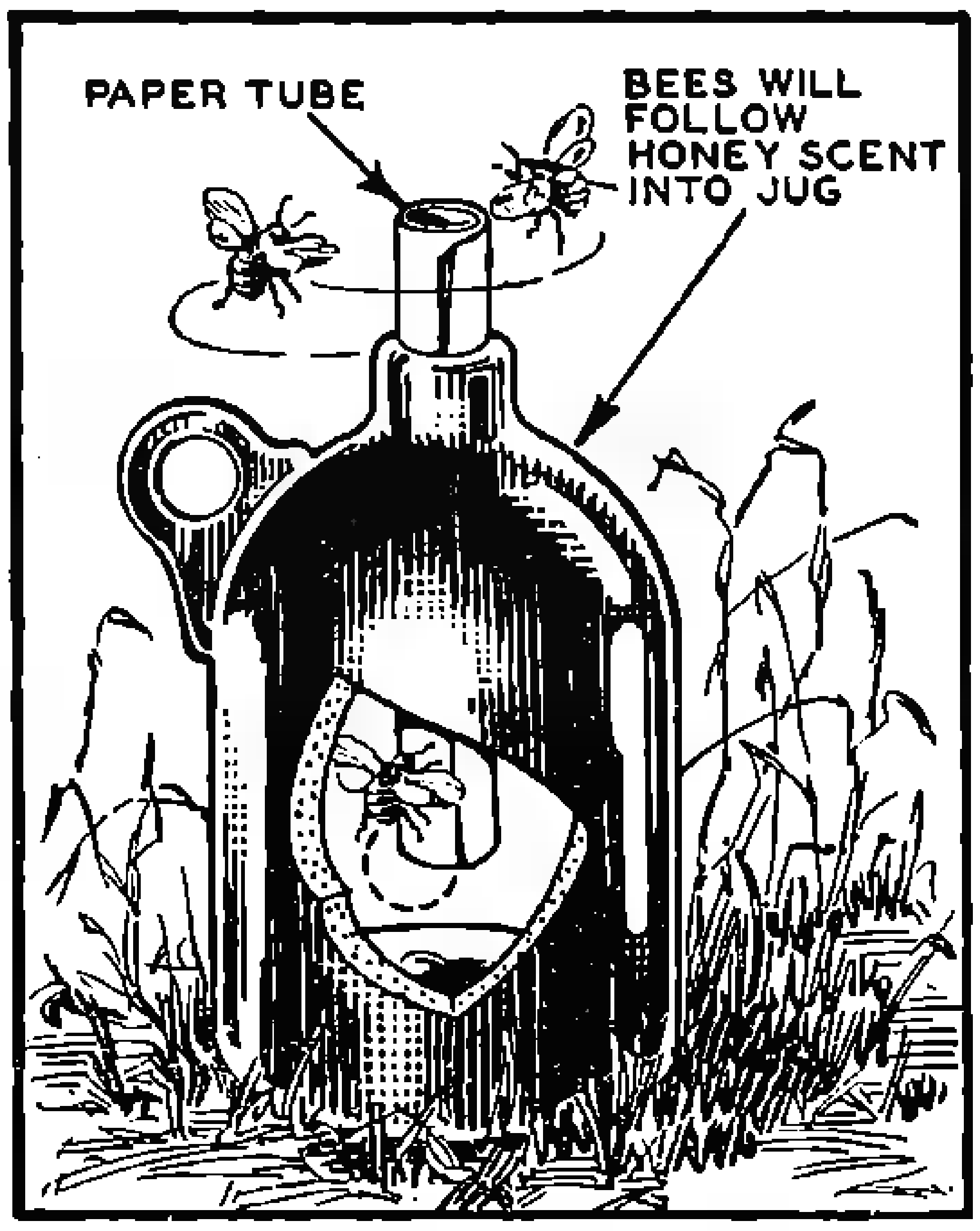
Sugar Bin Screen Pulverizes Lumps

SUGAR bought in bulk is very sensitive to moisture, and will harden into lumps whenever the air is a bit damp. By placing a quarter-inch mesh screen ledge at the rear of the sugar bin, any lumps found in the bin can be tossed on the ledge. Rubbing these lumps back and forth on the ledge soon breaks them up, and the pulverized sugar drops back into the bin. The above scheme can be used by merchants who buy sugar in bulk, or by the housewife who buys her sugar in 100 pound sacks. The screen can be soldered to the bin, or held with wooden cleats.—Lester P. Young.

Punch Two Holes at Once in Condensed Milk Can

EVAPORATED milk is best taken from its can by making two holes, one for the milk to come out, and one for air to enter the can. Here is a little device that will make the two holes at once. A piece of quarter-inch steel stock is drilled out at each end, and sharpened steel spikes forced into the holes as shown in the sketch. If found necessary the spikes may be anchored by threading or hard soldering. A wood handle is fastened to the steel strip with stove bolts. In using, just place the opener on the can and press.—Oscar Q. Fegas.



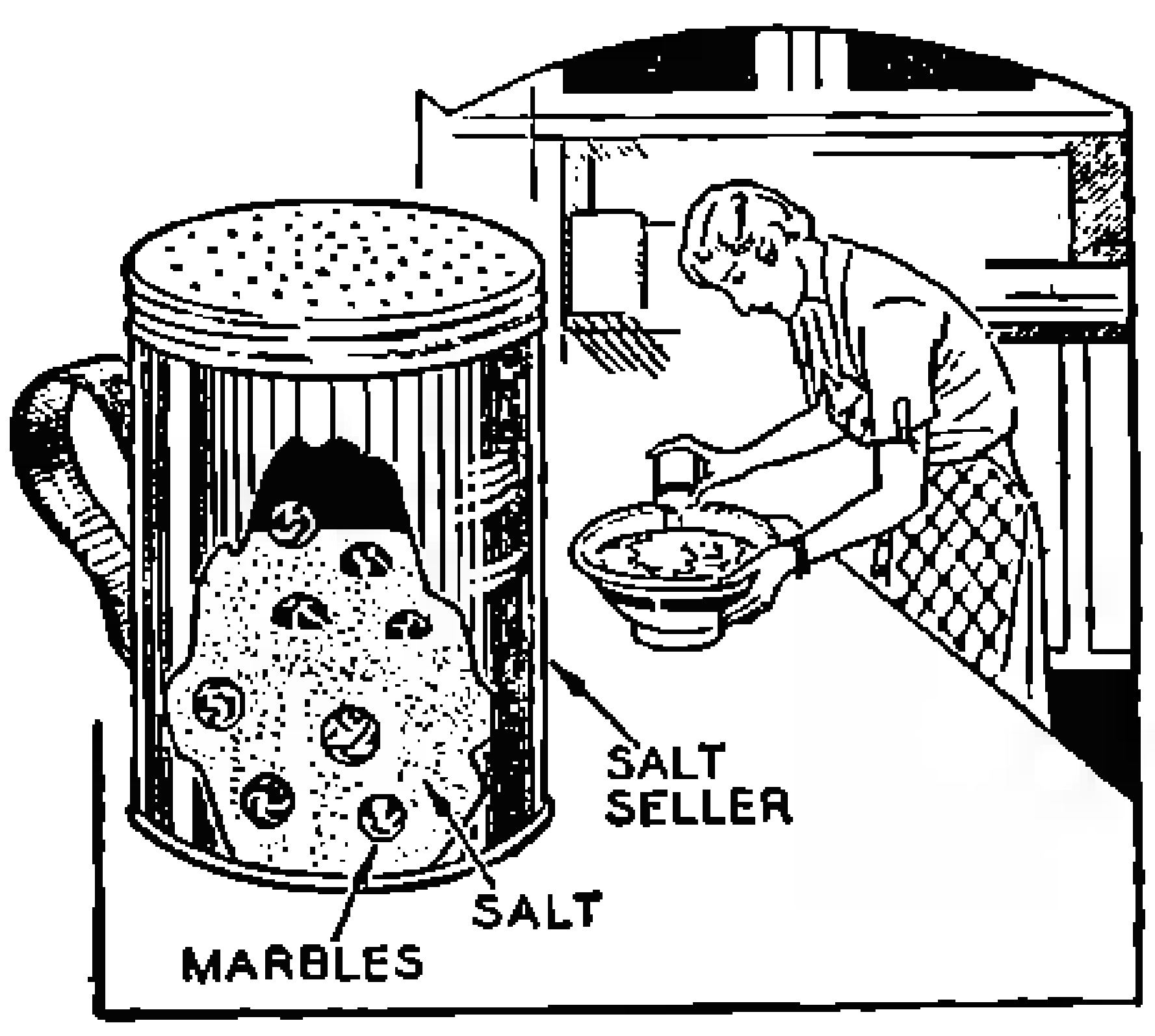

PAPER TUBE
BEES WILL FOLLOW HONEY SCENT INTO JUG

Stone Jug Makes Effective Bumble-bee Trap

BUMBLE-BEES and hornets often make their home near farm homes, where they enjoy life much to the annoyance of farm folk and live stock. A very simple jug-trap can be rigged up in a few minutes to catch these unwelcome visitors. A piece of newspaper is rolled into a tube to fit the mouth of a gallon stone jug, and a few drops of honey or syrup are placed within the tube. More honey is deposited in the jug, and the paper tube is inserted as shown. Bumble-bees will be immediately attracted by the sweet bait and enter the tube. Once they get through the tube into the jug, they will be unable to find their way out, and can be disposed of as desired. A couple of hours should be sufficient to trap an ordinary swarm of bumble-bees.—G. E. Hendrickson.

Glass Marbles Break Lumps in Salt Shaker

IN DAMP weather, salt will cake up over the holes in the top of the shaker, and will cake up into hard lumps inside. If a few common glass or porcelain marbles are placed with the salt inside the shaker they will stir up the salt continually as the shaker is used, and keep it running freely even in the dampest of weather. Different sizes and numbers of marbles can be used, according to the size of the shakers. —A. H. Waychoff.

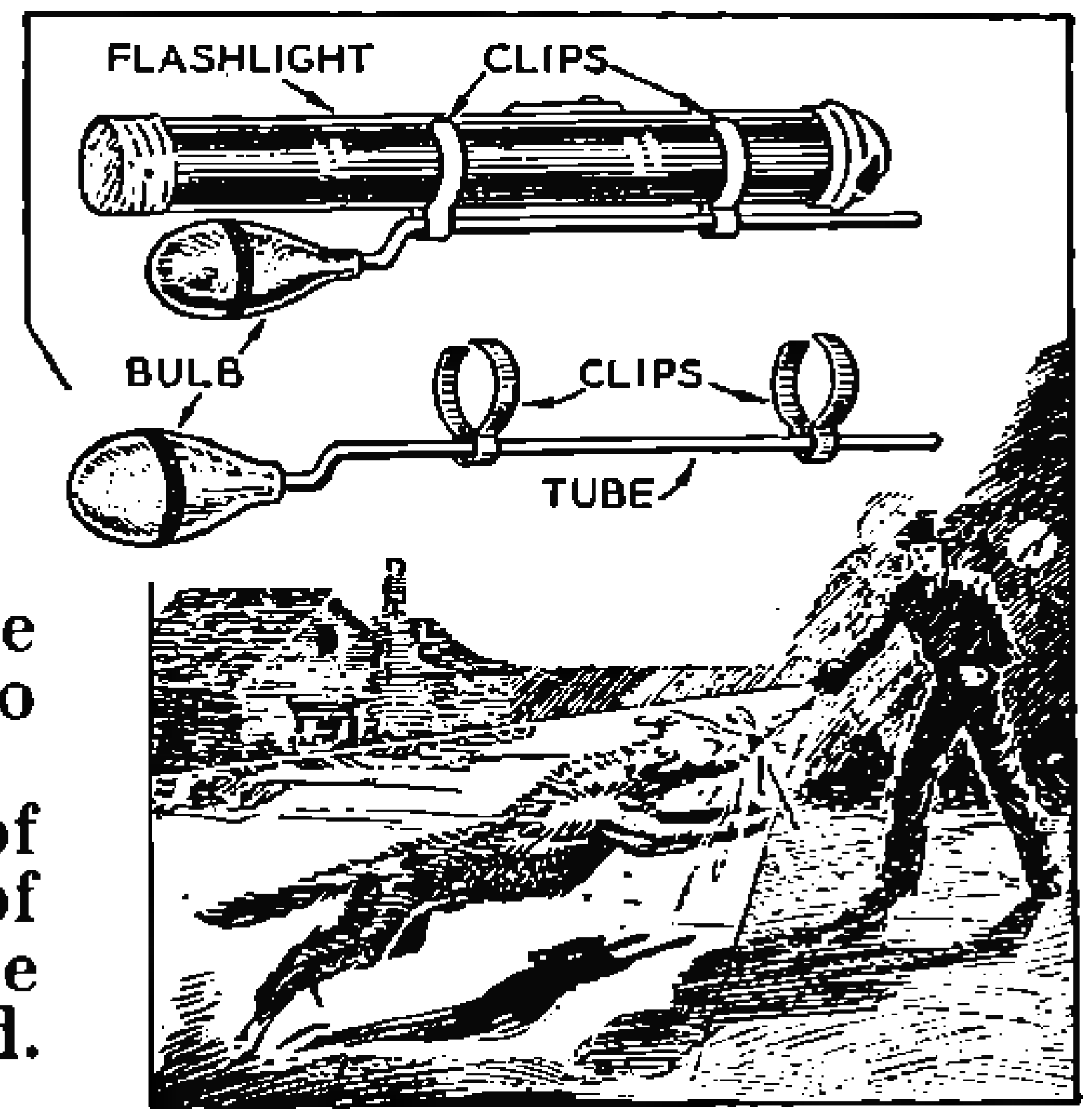


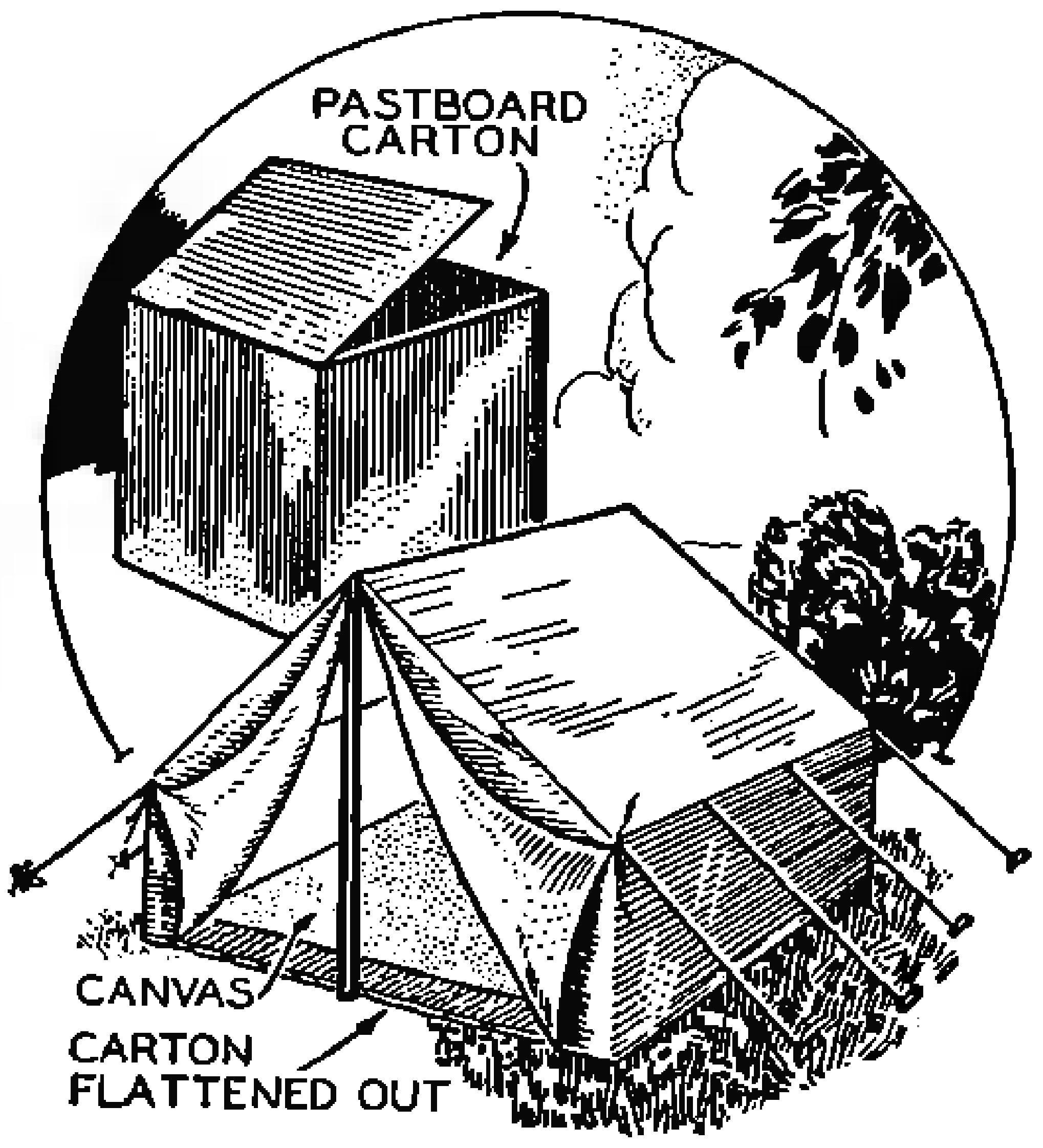
Ideas for the Outdoor Man

Ammonia Gun Easily Fastened to Flashlight

THIS combination of an ammonia gun with a powerful flashlight makes a weapon which will overcome any vicious dog or hold-up man. A rubber bulb about an inch in diameter is pressed onto a length of light copper or brass tubing, the end of the tubing being peined down to leave a nozzle opening about the size of a darning needle. Two bands of either sheet iron or spring brass are bent as shown to hold the ammonia tube tightly to the barrel of the flashlight. The tubing must be bent slightly so the rubber bulb will just clear the flashlight barrel.

After the bulb is filled with ammonia, a slight pressure of the bulb will shoot a fine stream of ammonia a distance of about 30 feet. The flashlight beam gives perfect hits, for the ammonia stream will hit wherever the light beam is flashed. —A. H. Waychoff.



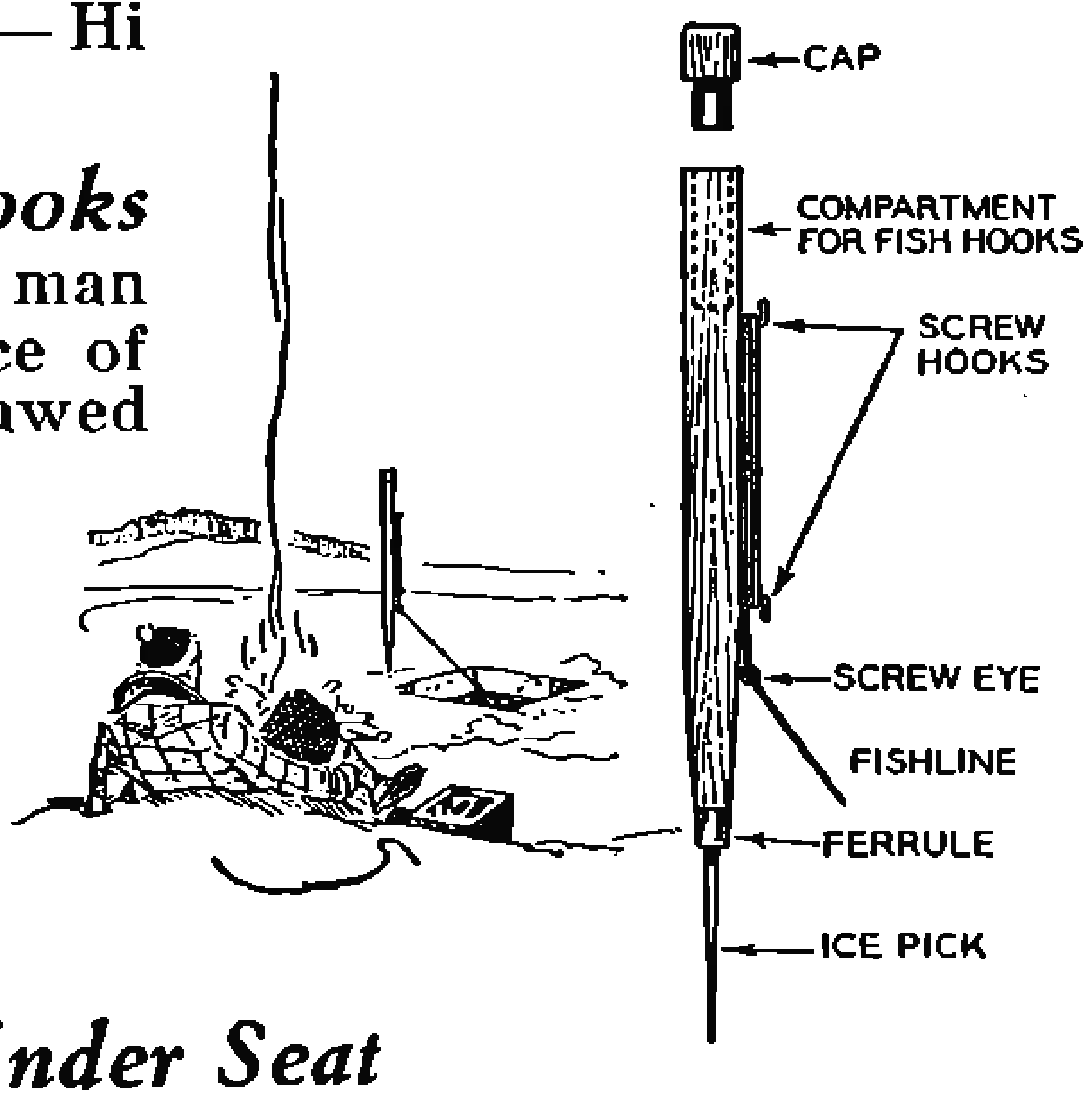


Pasteboard Cartons Make Fine Tent Floor

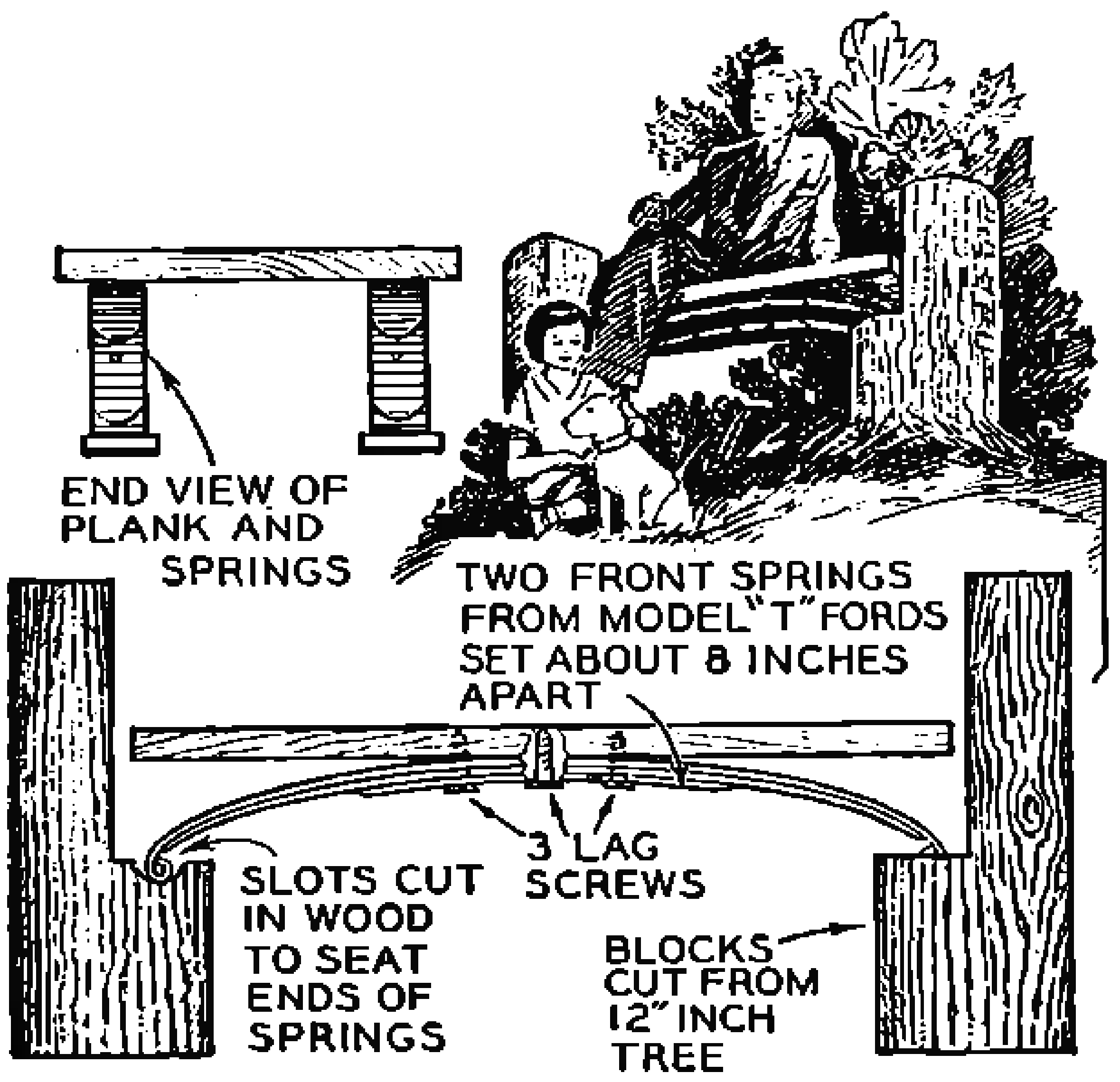
TOURISTS who must pitch their tents each night have often wished for a tent floor which would not break through with the pressure of a heel, which would be clean, and which could be easily moved with the tent canvas. California campers have solved this problem very nicely by flattening out old pasteboard cartons, cutting them into sizes which can easily be folded and packed into a compact bundle. After the tent is pitched, these squares of pasteboard are laid on the ground and covered with a square of canvas the size of the tent floor. This works even better than a linoleum floor, and weighs much less. In addition, the corrugated cardboard pieces form an insulating air cushion which keeps any dampness in the earth from getting into the tent. — Hi Sibley.

Handy Ice Fishing Outfit Holds Line and Hooks

HERE is a nifty ice fishing outfit which the handy man can build easily for only a few pennies. A piece of maple 1" in diameter and 25 inches in length can be sawed from an old pitchfork or broom handle. Drill a compartment for fishhooks and leaders in one end, and cut a wooden cap to cover this hole. If you have a lathe, you can do a neat job in a few minutes. Remove the handle from a small ice pick, being careful not to injure the ferrule. Taper the other end of the maple pole enough so the ferrule will fit snugly over it, and force the metal ice spike into it. Put on two screw hooks and the screw eye as shown.—Al Allard.



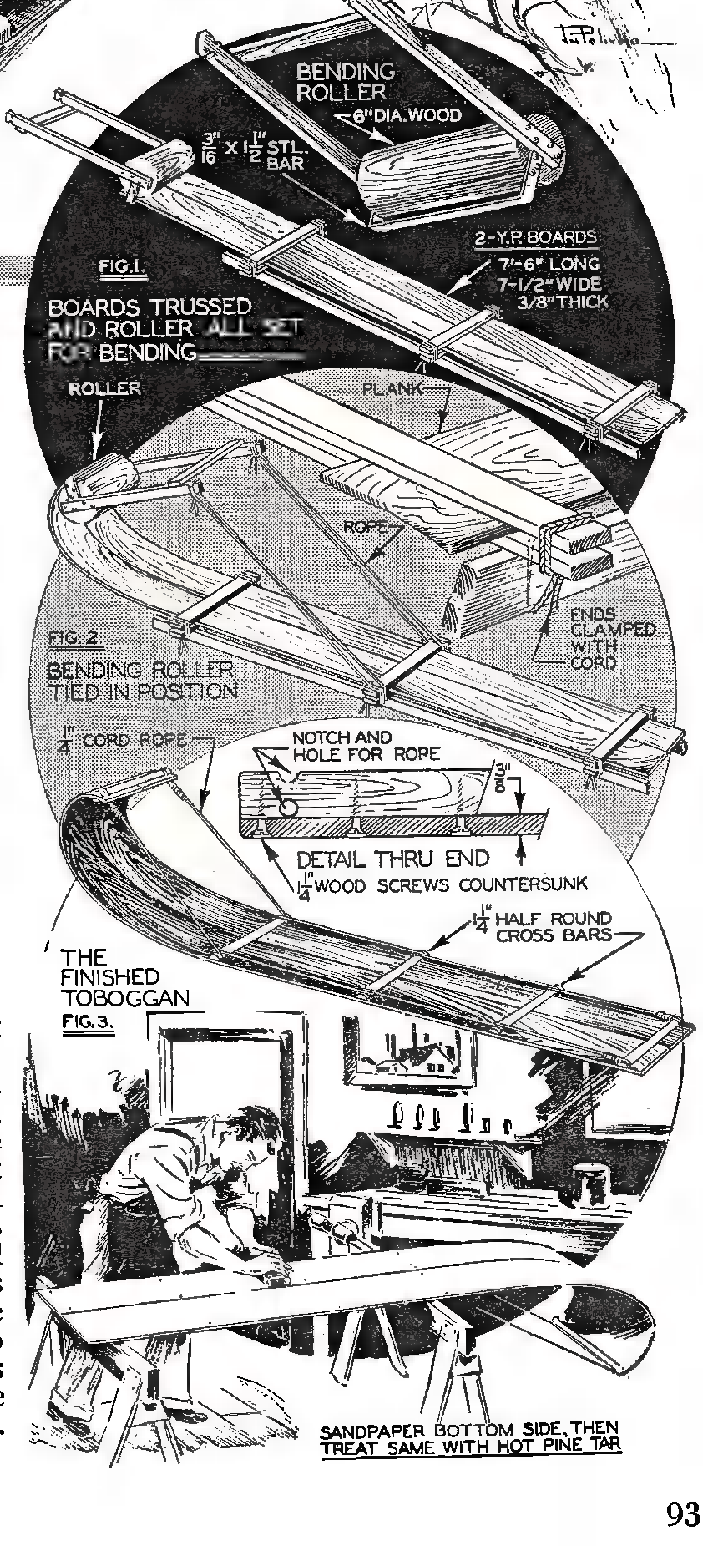
Rustic Lawn or Camp Bench Has Springs Under Seat


END VIEW OF PLANK AND SPRINGS
TWO FRONT SPRINGS FROM MODEL "T" FORDS SET ABOUT 8 INCHES APART
3 LAG SCREWS
SLOTS CUT IN WOOD TO SEAT ENDS OF SPRINGS
BLOCKS CUT FROM 12" INCH TREE

A COMFORTABLE rustic bench for your backyard garden or lakeshore cottage can be made from a 1x12 pine or oak plank, a section of a twelve inch tree, and a few parts from that old standby, the Model T Ford. Get two front springs and remove all leaves but the lower one. Cut your seat plank just a bit longer than the springs, and fasten the springs to it as shown, keeping the springs about eight inches apart.

Almost any kind of log can be used for the ends of the seat. Cut notches in each end as shown in the sketch, and sink the logs a foot or two in the ground, spacing them so the seat plank will fit loosely between the notches. With a chisel or gouge cut two slots about 8 inches apart in each support, wide enough and deep enough so the springs will slide back and forth smoothly as weight is placed on the seat.—Bob Poulson.

Fine FUN With Simple TOBOGGAN


BENDING ROLLER
6" DIA. WOOD
$\frac{3}{16}$" x 1$\frac{1}{2}$" STL. BAR
2-Y.P. BOARDS
7'-6" LONG
7-1/2" WIDE
3/8" THICK
FIG.1.
BOARDS TRUSSED AND ROLLER ALL SET FOR BENDING
ROLLER
PLANK
ROPE
ENDS CLAMPED WITH CORD
FIG. 2.
BENDING ROLLER TIED IN POSITION
$\frac{1}{4}$" CORD ROPE
NOTCH AND HOLE FOR ROPE
$\frac{3}{8}$"
DETAIL THRU END
1$\frac{1}{4}$" WOOD SCREWS COUNTERSUNK
$\frac{1}{4}$" HALF ROUND CROSS BARS
THE FINISHED TOBOGGAN
FIG.3.
SANDPAPER BOTTOM SIDE, THEN TREAT SAME WITH HOT PINE TAR

Steps to follow in building up your own toboggan are shown at right.

Richard K. Wood, noted outdoor sports writer, designed this toboggan after the trappers' trail toboggans of the North.

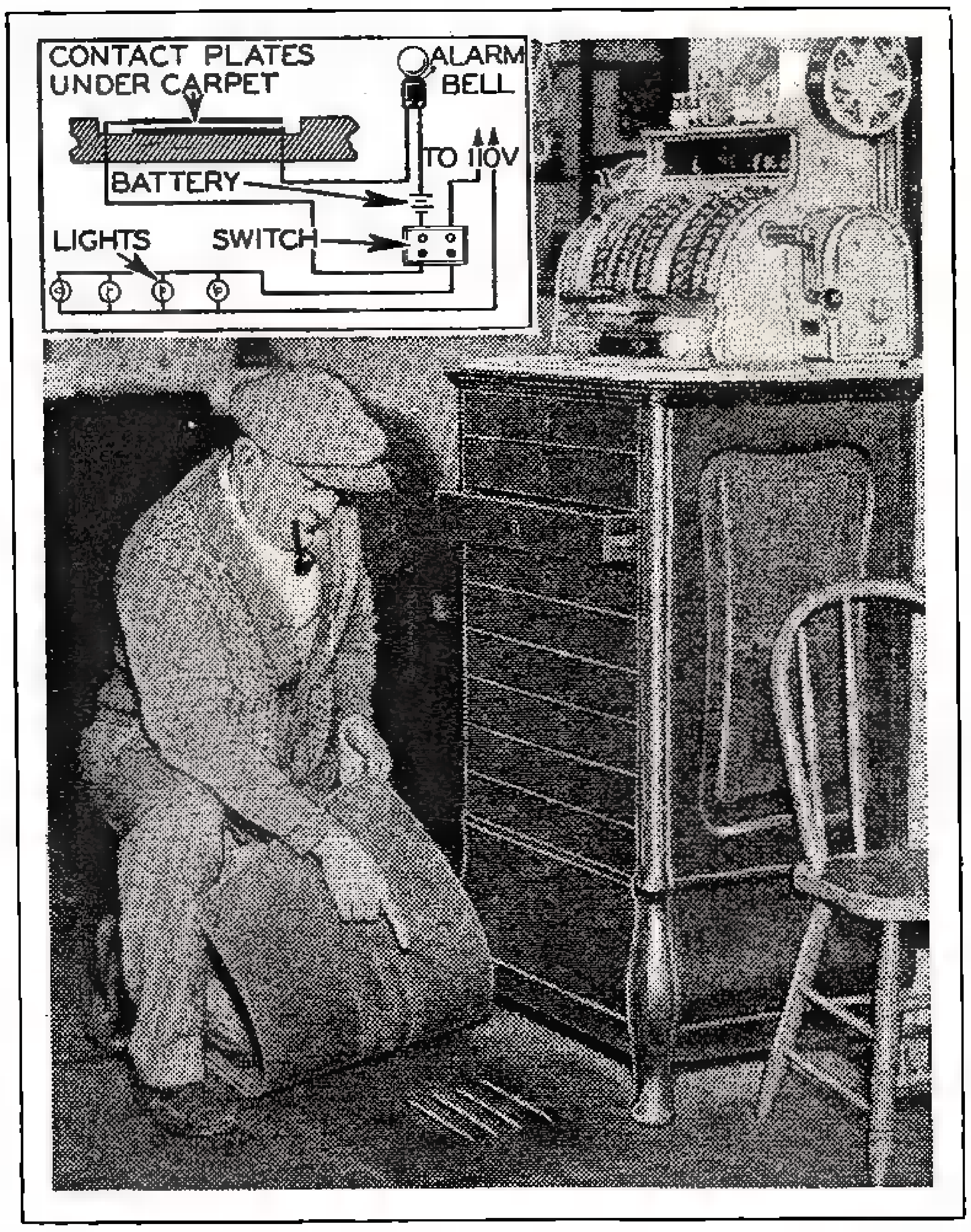
THE toboggan is one of the favorite vehicles of transportation in the Northern bush country. Whether drawn by hand or by sled dogs, the toboggan is indispensable for the trapper and the hunter who travels far back into the green timber, after snowfall. Boys who live in the Northland use the toboggan for sport, as well as a means of conveyance. There is nothing quite so exhilarating as a toboggan ride down a long sloping hill.

Any man or boy familiar with the use of wood working tools can make his own toboggan. The one shown here is really easy to make, and yet the manufactured sort are not by any means inexpensive.

Since the toboggan is almost invariably drawn over a snowshoe trail, it should not be wider than the snowshoe. Fourteen inches is about right. Two boards 8½ inches wide and one inch thick will be required; the length should be 7½ feet. The extra width is allowed for trimming and shrinkage. If mill dressed boards are not procurable, select a straight grained birch tree about fifteen inches in diameter, fell it and cut off a 7½ foot section. Groove both sides of the log, to insure a straight split, then hew an inch board from each half of the log, as near the bark side as possible. Avoid flaws and streaks of red heart wood. The bark side of the boards should be planed perfectly smooth, for the bottom, then the edges dressed and the top of the boards planed down to a thickness of ⅜ inch, except the thickness should be ¼ inch where the bend will come in front.

(Continued on page 120)

Burglar Alarm for Country Stores Rings Bell in Home



Strips of stiff music wire above a metal plate in the floor are bent down when anyone steps near the cash register, closing a circuit to an alarm bell and battery which may be either in the home or the store.

A SIMPLE burglar alarm that will operate whenever anyone steps near the cash register can easily be set up in the country store that is located some distance from the home.

An area about ¼" deep is cut out of the floor directly in front of the cash drawer, and a metal contact plate tacked down.

Stiff music wire is fastened above the plate, taking care that all pieces of wire are connected together. The wires are bent so they are level with the floor, and do not touch the plate. Leads are brought through the floor from the wire and the plate, and two wires run to the house where they connect to a bell, battery or transformer, and switch. A rug or rubber mat is placed over the wires in the floor.

Whenever anyone steps on the mat, the music wire will be pressed down until it makes contact with the metal plate, and the bell circuit will be closed. Store lights can then be turned on when the alarm bell rings.

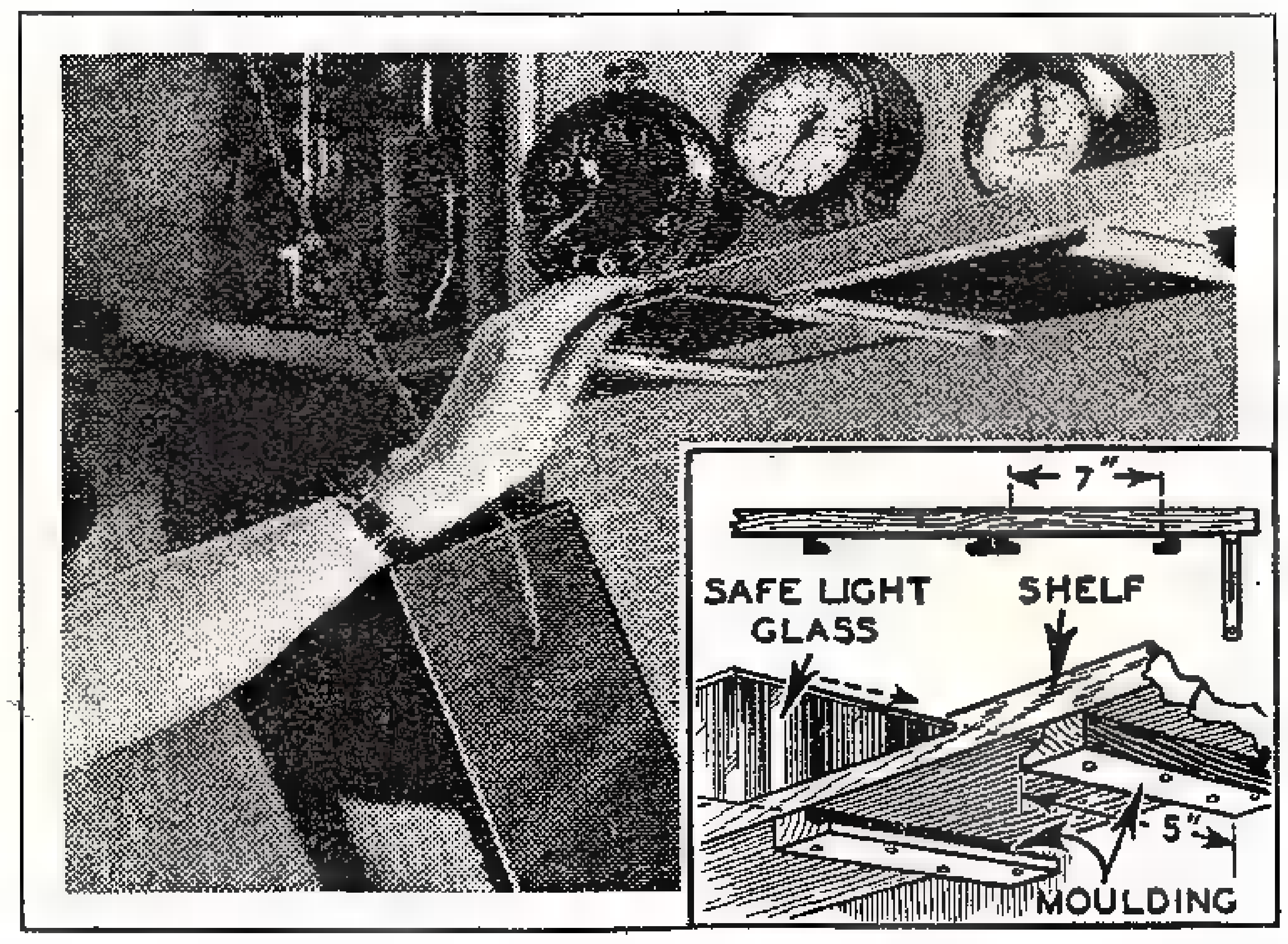
Moulding Makes Darkroom Shelf

A HANDY shelf for safe-light glasses used continually in the darkroom can be made from a few scrap pieces of L-shaped moulding.

For the ordinary 5"x7" safe-light glass cut two 5" pieces of moulding and nail them to the under side of any convenient shelf. Glass may easily be slipped into this shelf, keeping it off the bench where it may be broken.

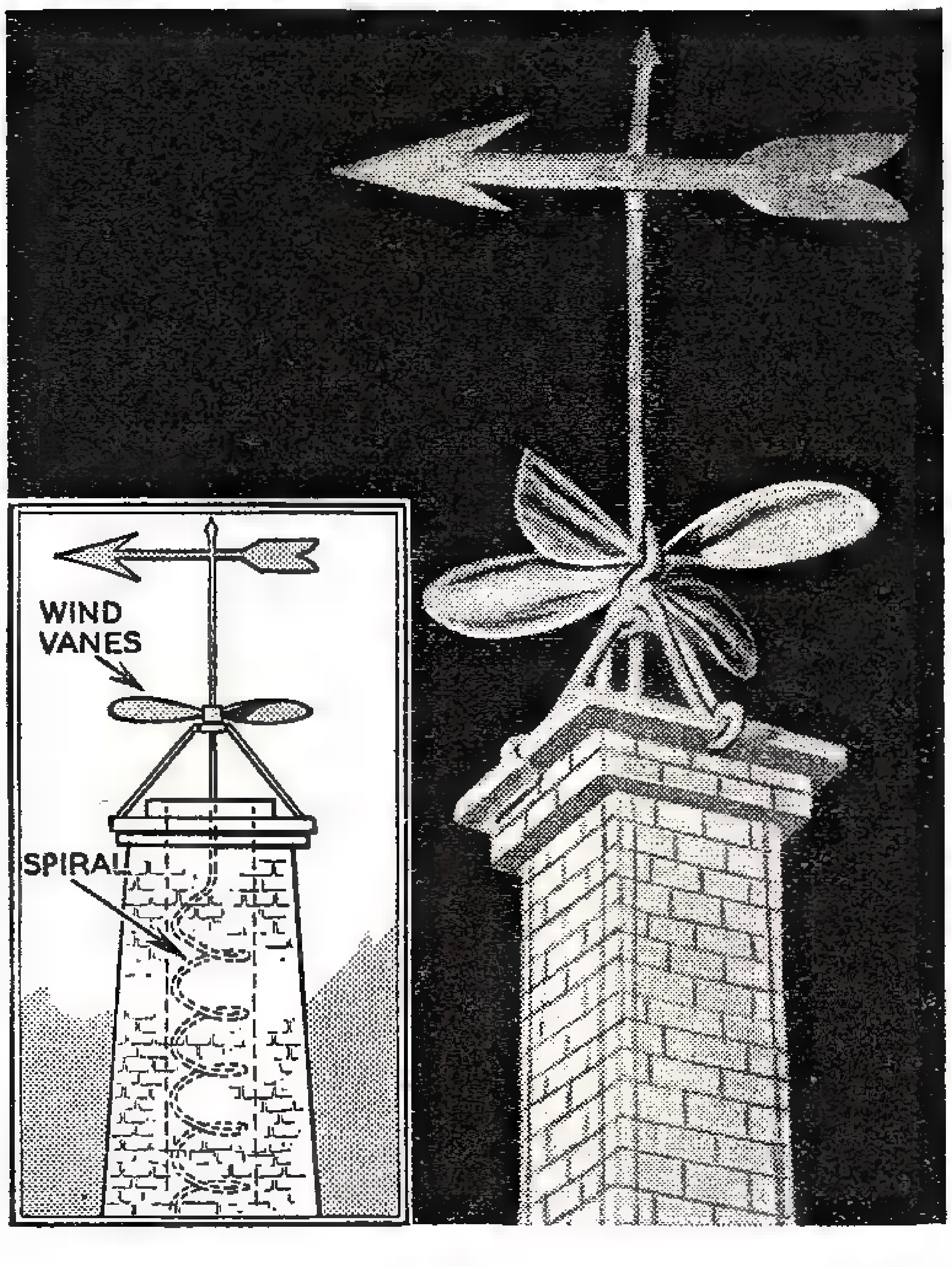
Separate shelves may be made for each color of glass if desired. Old glass camera plates can also be stored in this manner.

Tiers of shelves can be made by nailing the L-shaped strips on top of each other.



L-shaped moulding tacked to the under side of a shelf as shown makes convenient pockets for safe-light glasses for the darkroom lamp, and for glass camera plates.

Spiral Wire Keeps Chimney Clean



A spiral of wire extending from top to bottom of chimney and driven by propeller vanes at the top, gives continuous removal of soot in chimney, and insures constant draft.

A GRAND RAPIDS, Michigan, inventor has devised an apparatus which insures a continuous draft in the chimney flue, and constantly removes soot from the chimney.

A quarter-inch wire wound in corkscrew fashion, and extending the entire length of the chimney, is driven by a propeller-like fan turning in the wind above the chimney. The rotating blades continually suck air and soot up the chimney.

SPARKS from the RADIO EDITOR

Edited by L. B. ROBBINS

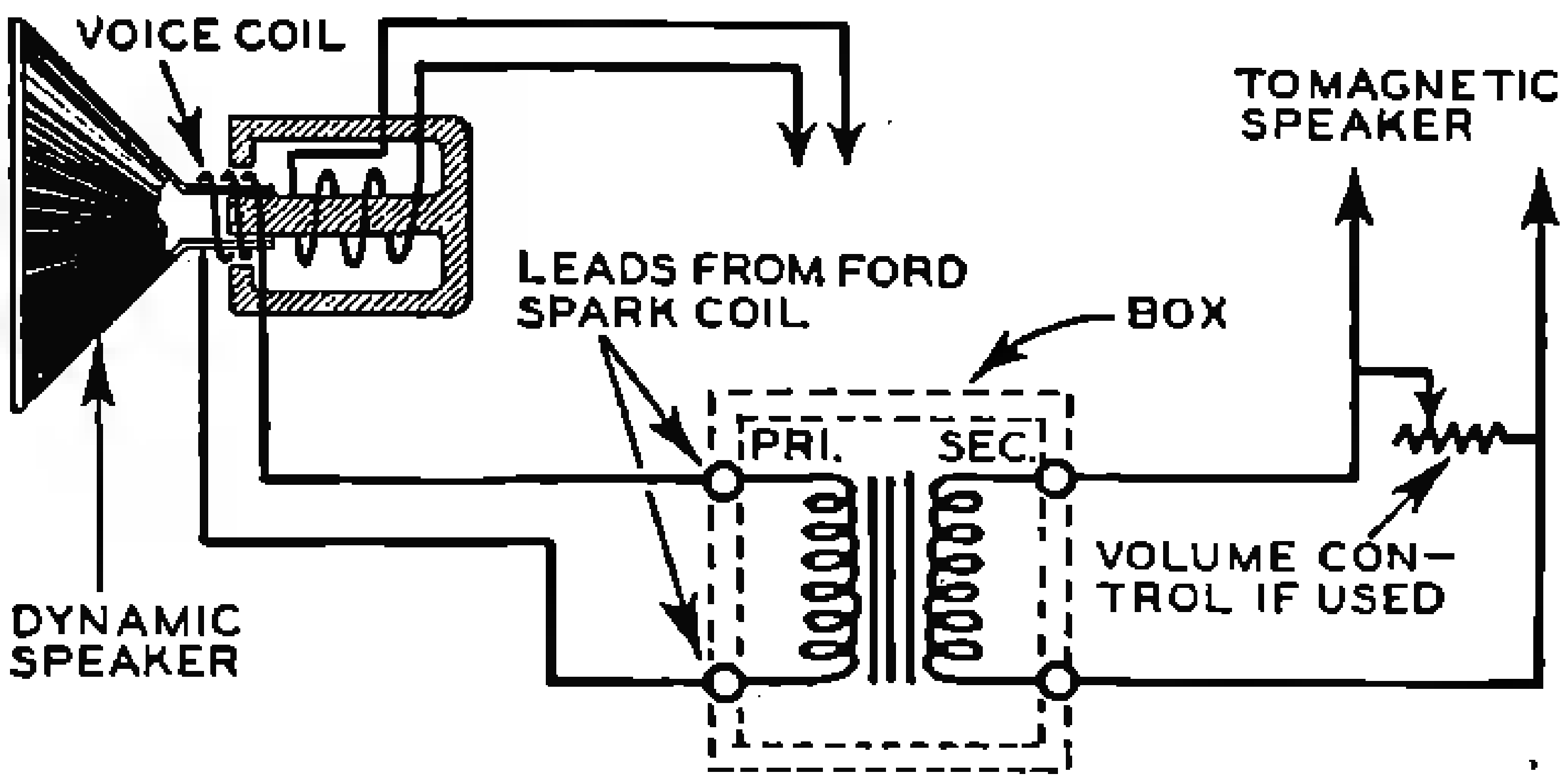
How to Hook Additional Speakers to the New Radios

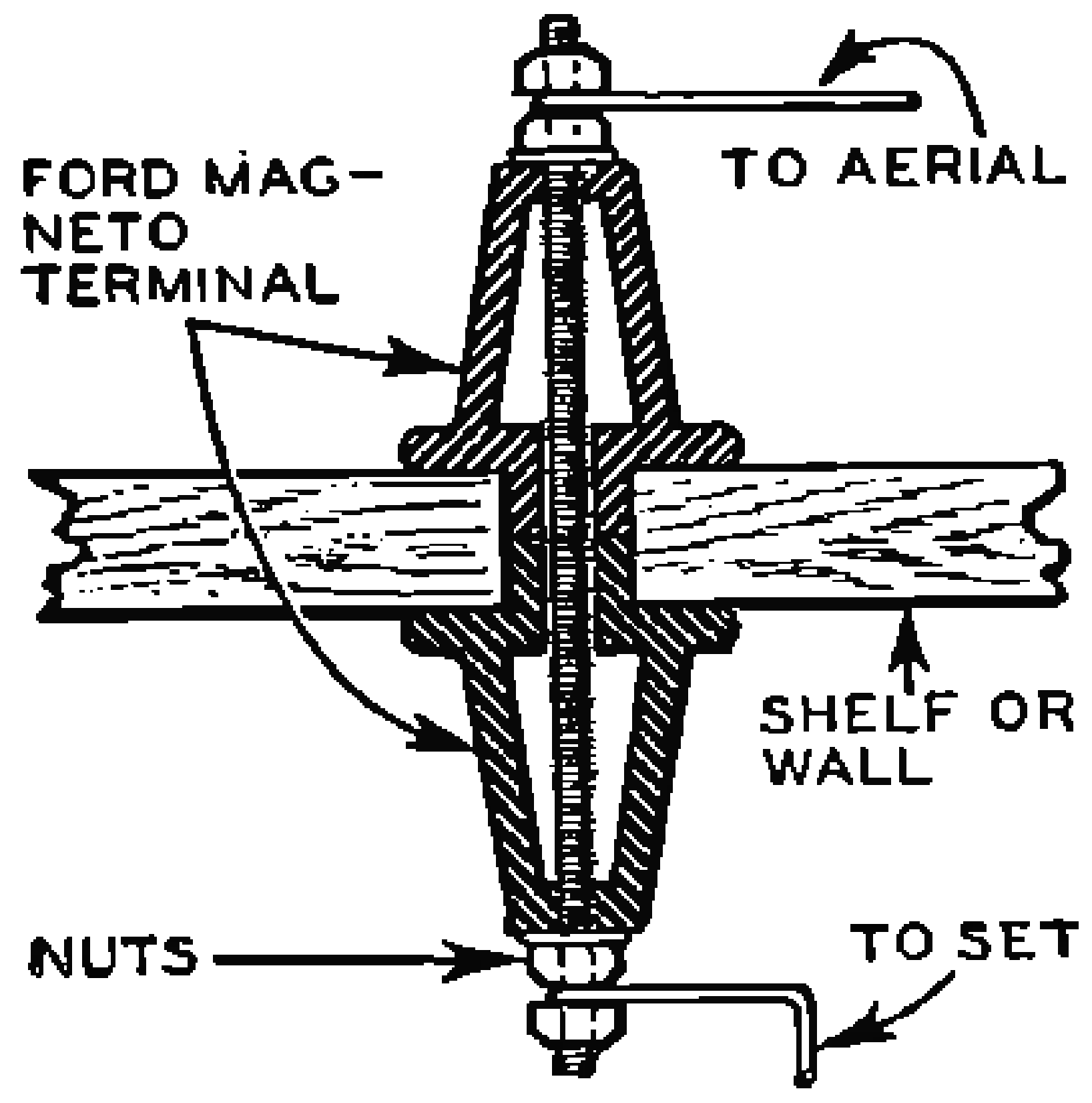
ALTHOUGH most new radio sets have dynamic speakers, it is still possible to hook up magnetic speakers in parallel with the set, when it is desired to hear the radio in a number of isolated rooms.

Take apart a Ford T spark coil, being careful not to damage the leads to the coils. Mount the coil and core in a small wood or metal box, and connect the coil leads to binding posts mounted on the top of the box. Mark the posts going to the coil having large wire "PRI" and those connected to the very fine wire "SEC".

Mount the box in or near the set, and run two wires from the "PRI" posts to the dynamic speaker, soldering them to the voice coil leads (the coil mounted on the speaker diaphragm). Wires may then be run from the "SEC" posts to from one to three speakers in different parts of the house.

The volume of the extra speaker may be controlled by connecting a variable resistor 1000 ohms or larger in size across the magnetic speaker terminals.



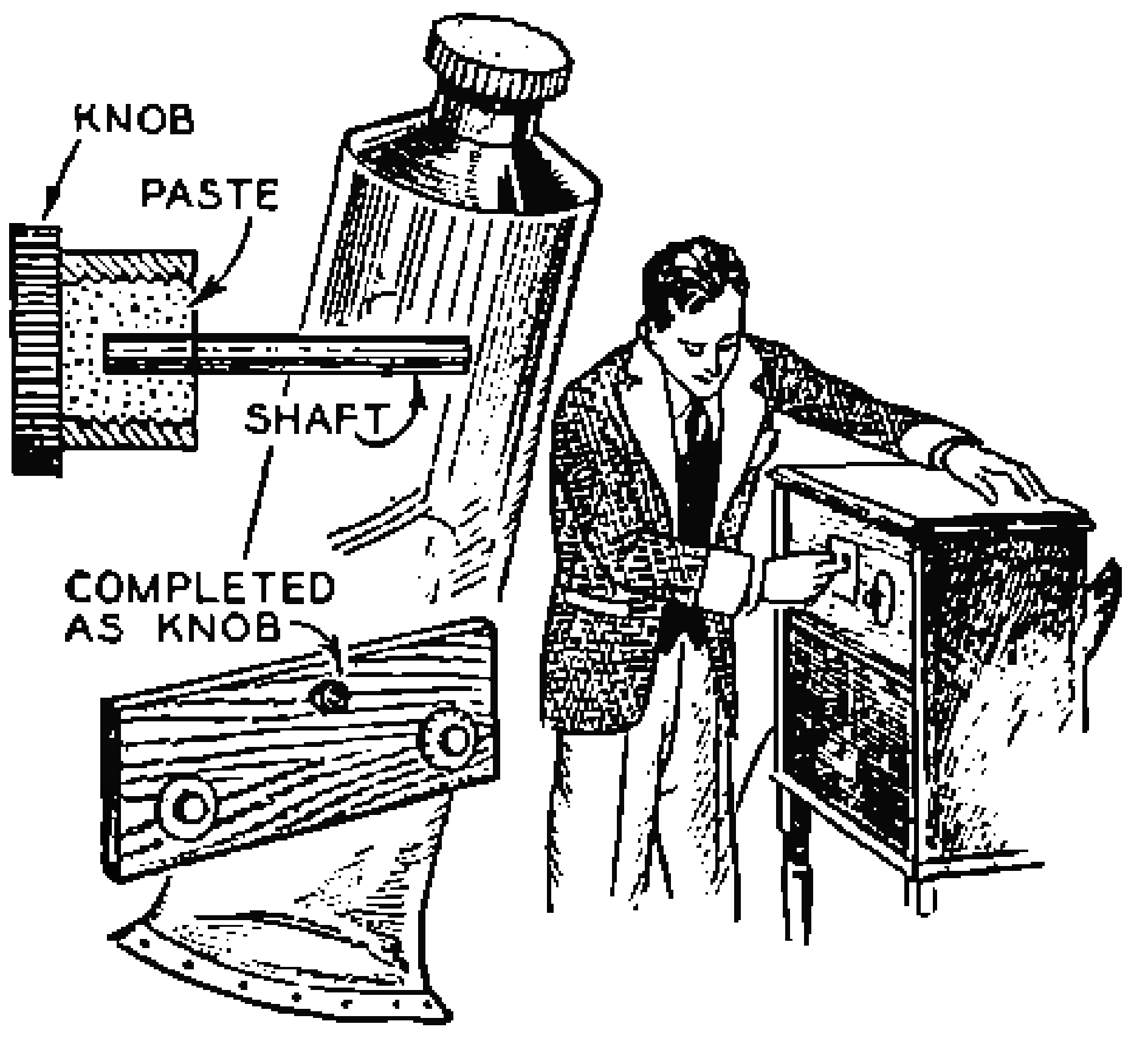


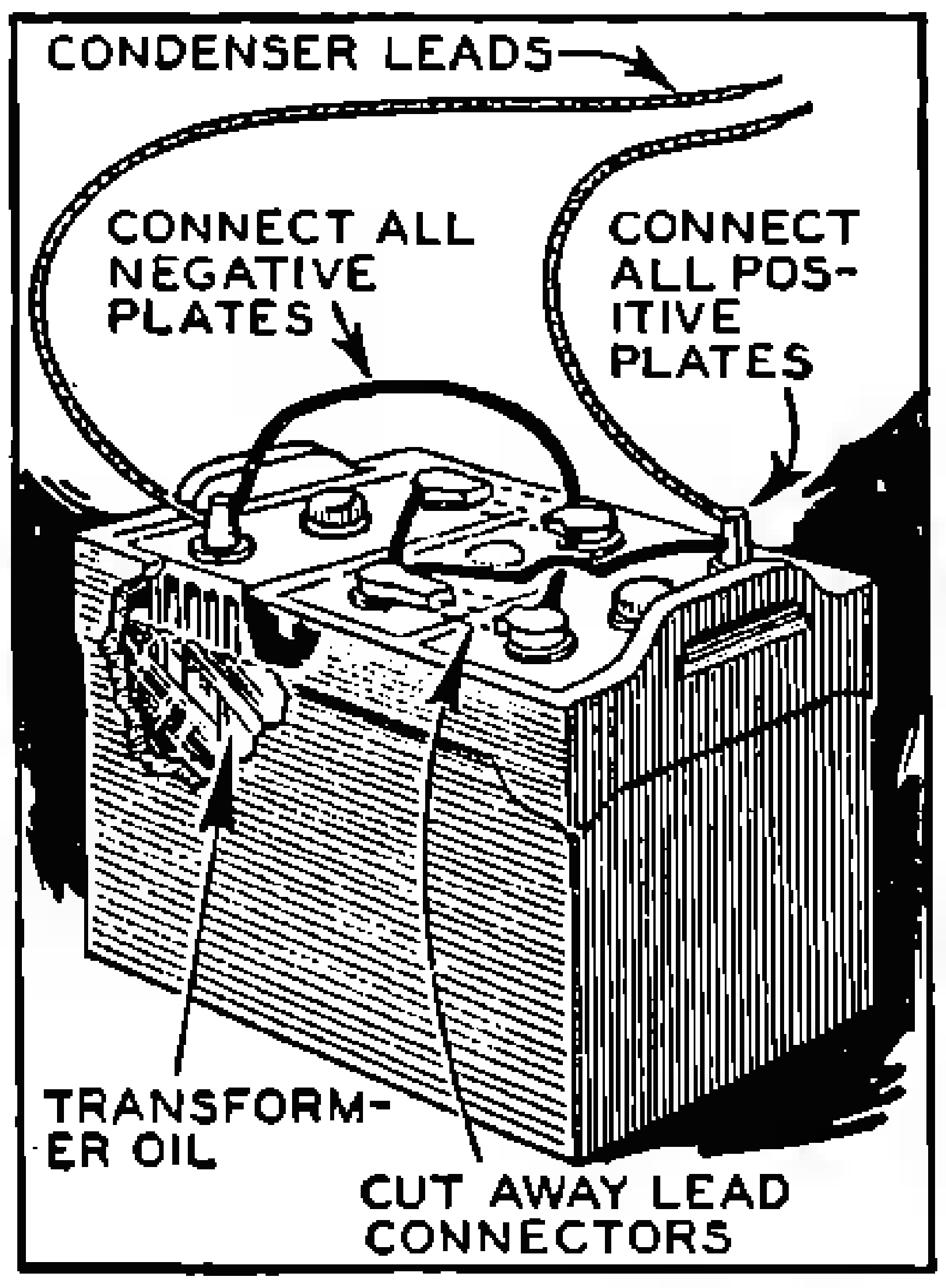
Ford Magneto Terminals Make Good Insulators

MAGNETO terminals from the old model T Ford may be used to advantage as stand-off insulators by short wave enthusiasts. Remove all dirt and grease with gasoline. When using them to bring an aerial wire through a wall drill a hole the size of the terminal base, and bolt two terminals together as shown, one on each side of the wall. The terminals are more than strong enough for this purpose, and have very high insulating qualities.

Hard Rubber Toothpaste Caps Make Improvised Radio Set Dials

THE hard rubber caps found on tubes of tooth paste may easily be converted into small radio knobs such as are used for switches and volume controls. File rough notches in the shaft on which the knob is to be fitted. Fill the tooth paste cap with a good grade of cement, wood filler, or glue, and press it firmly over the shaft. Wipe off any excess cement and allow to dry. The many-colored hard rubber caps now being used on perfume and hair tonic bottles may also be used in this manner where somewhat larger dials are needed.



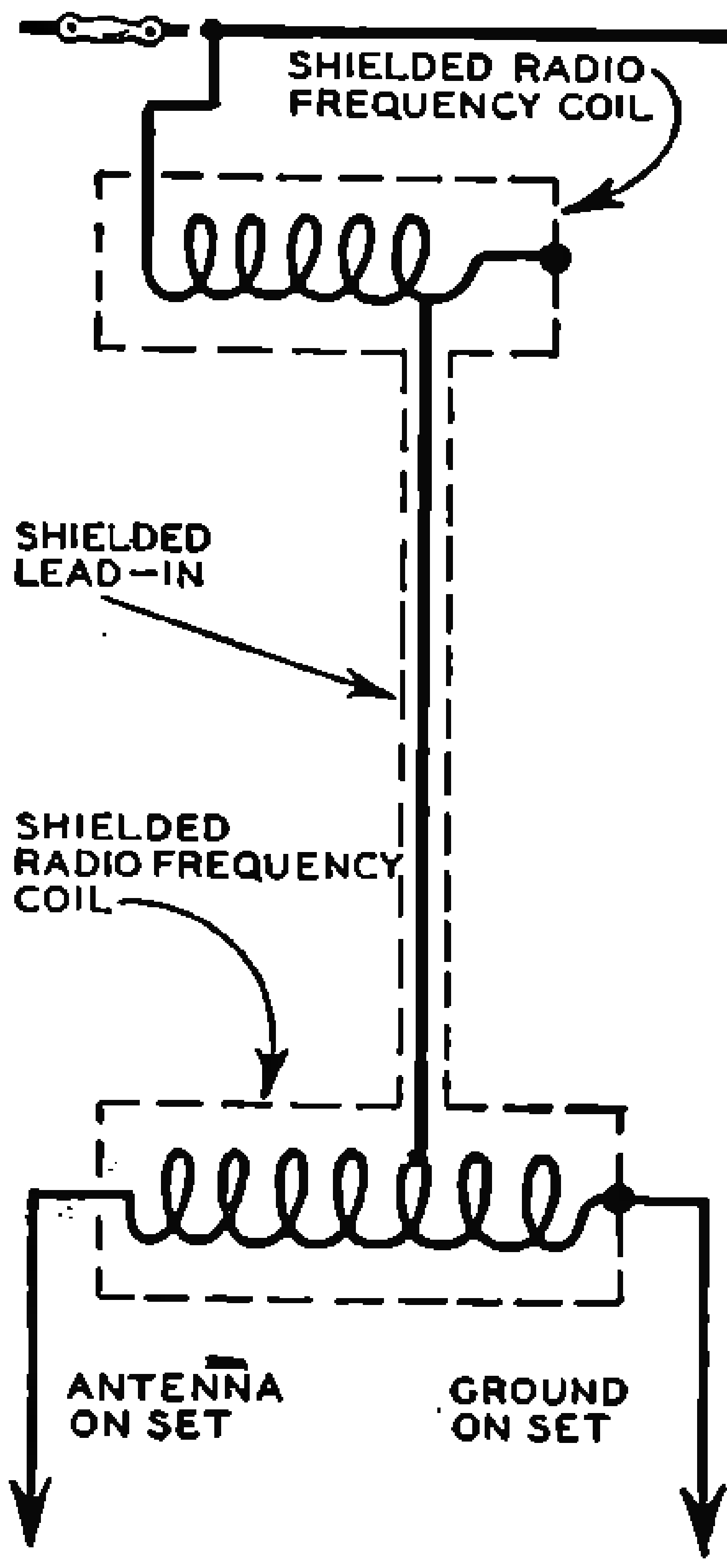


Storage Battery Makes Transmitting Condenser

AN OLD storage battery may be converted into a good high voltage transmitting condenser for that ham set. First drain the battery of acid. Wash well with hot water to clean out all acid and sediment at the bottom of the plates. Flushing with a hose will do the job nicely, or even better—let the water stand in the battery for a day or so.

Cut away the heavy lead straps connecting the three cells. Connect all positive plates together and all negative plates together by soldering in short wire leads as shown in the sketch. The two resulting terminals are the condenser connections. Now fill all three cells with transformer oil such as can be obtained from your local power company, covering the plates about ¼ inch. This condenser will stand up to 1000 volts or more, depending upon the internal condition of the plates, and will have a high current capacity.

Shielded Antenna Lead-in Helps Reduce Electrical Noises



THE modern antenna is one which will reduce or cut out disturbances produced by nearby electrical apparatus. It is not difficult to rig up, requiring only a shielded lead-in wire and two ordinary shielded radio frequency coils.

Get two r.f. coils of the size suited for .00035 tuning. Connect plate and grid windings of one together to form a tap connection for the lead-in wire, and ground the remaining plate coil lead to the shield and to the radio set ground. The grid coil lead is insulated and connected to the antenna post of the radio set.

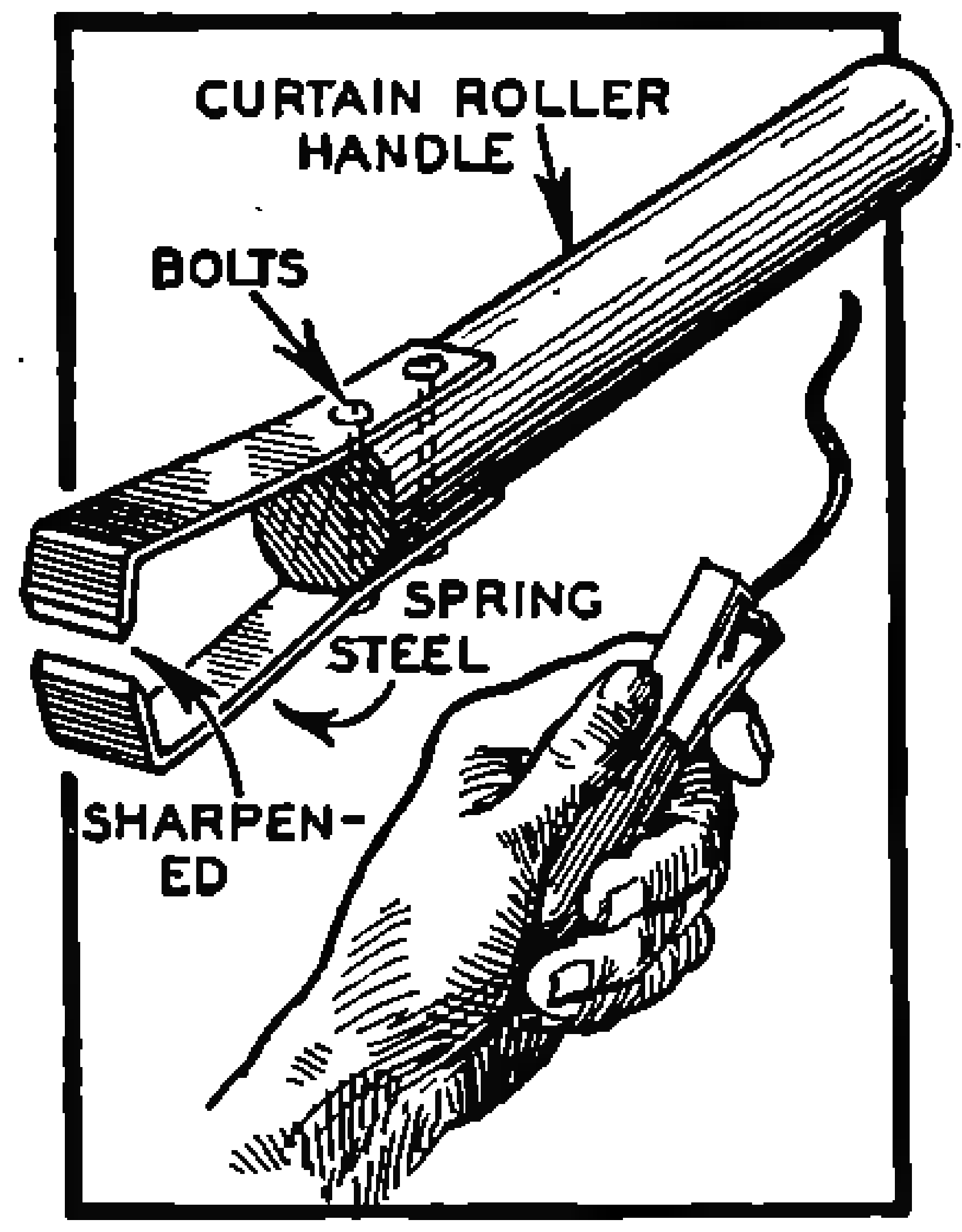
The second r.f. coil is mounted on the antenna post near the point where the lead-in connection is made. Grid and plate coils are connected together as before to make a tap for the lead-in connection. The insulated grid lead is connected to the antenna, and the plate lead is grounded to the coil shield and the lead-in shield.

It may be necessary to drill a hole in the can of the coil nearest the radio set, and attach a metal terminal for the ground connection. Care should be taken that the shield of the lead-in wire is securely grounded to the metal cans at each end, and that the wire itself does not touch the shield at any point.

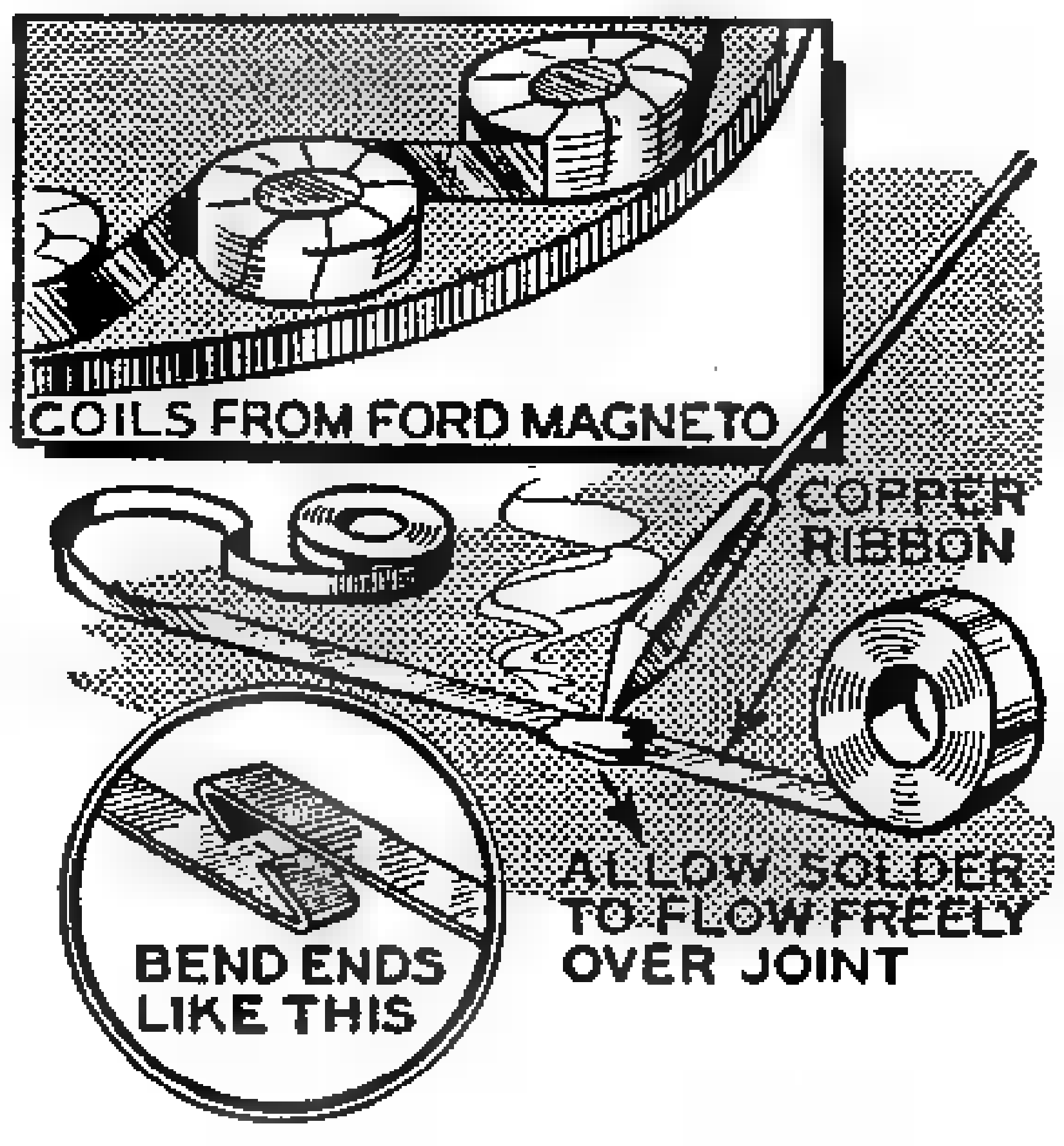
The antenna is now ready for use. Electrical disturbances and all static noises lower than the radio frequencies will be passed off to the ground by the coils, and only the radio frequency signals of the broadcasting station will reach the set.

Handy Wire Stripper Made From Clock Spring

INSULATION may be easily and quickly stripped from all kinds and sizes of insulated wire with this handy wire stripper. Make the handle by cutting off a four inch length from a broom handle and flattening two opposite sides. Get two pieces of heavy clock spring, each about four inches long. Heat them to a cherry red and allow to cool slowly. Drill two holes through one end of each, and bend the other ends at right angles as shown. Grind the ends to a knife-like edge, reheat, and plunge in oil to regain the temper. Sharpen the cutting edges on an oil stone, and fasten the springs to the handle as shown.



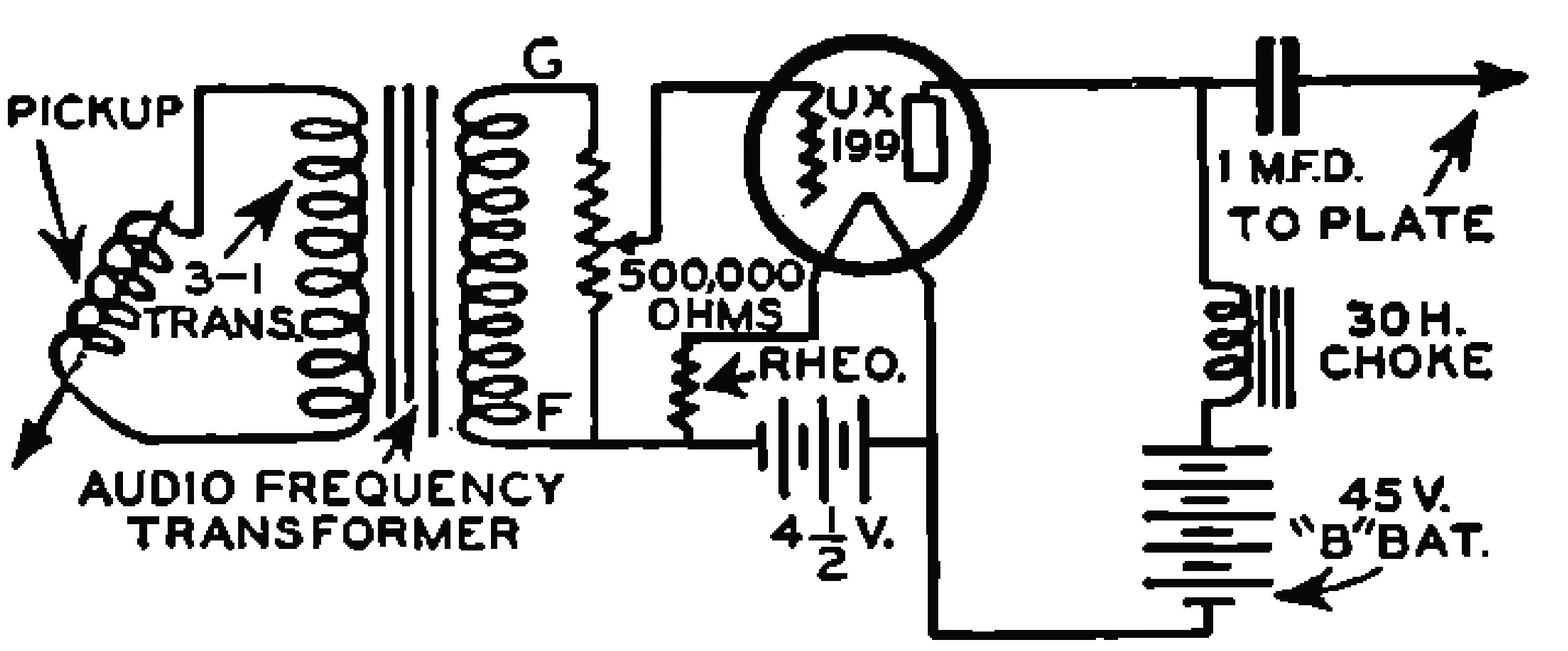
Ford Magneto Ribbon Makes Efficient Antenna



THE copper ribbon found on model T Ford magnetos will make an antenna which will stand up in any ice storm, and which will add plenty of distant stations to your DX list.

One magneto contains about 175 feet of around No. 22 gauge, 3/16" wide copper ribbon, in 16 pieces, each a little less than 11 feet long. Clean the ends of the ribbon, bend as shown in the sketch, and dip in rosin flux or any good non-corrosive soldering paste. Hook the ends together, and run solder freely over the entire joint. The result is a joint almost as strong as the wire tape itself.

Amplifier Increases Volume of Phonograph Pick-up



DISAPPOINTING results are often obtained when a phonograph pick-up is used with some of the smaller A.C. radios, principally because these sets have only one stage of audio-frequency amplification. The one-stage amplifier circuit shown here will boost up the volume to the desired level.

The detector tube of the radio set is removed from its socket, the amplifier plate lead is connected to the plate terminal of the socket, and the 199 tube filament is grounded. The parts necessary are: a 3 to 1 audio frequency transformer; 500,000 ohm volume control; UX 199 tube and socket; 30 ohm filament resistor; 4½ volt C battery for filament supply; 45 volt B battery for plate supply; 1 mfd. fixed condenser; and a 30 henry filter choke—an old audio transformer primary will do. A higher B battery voltage may be used.

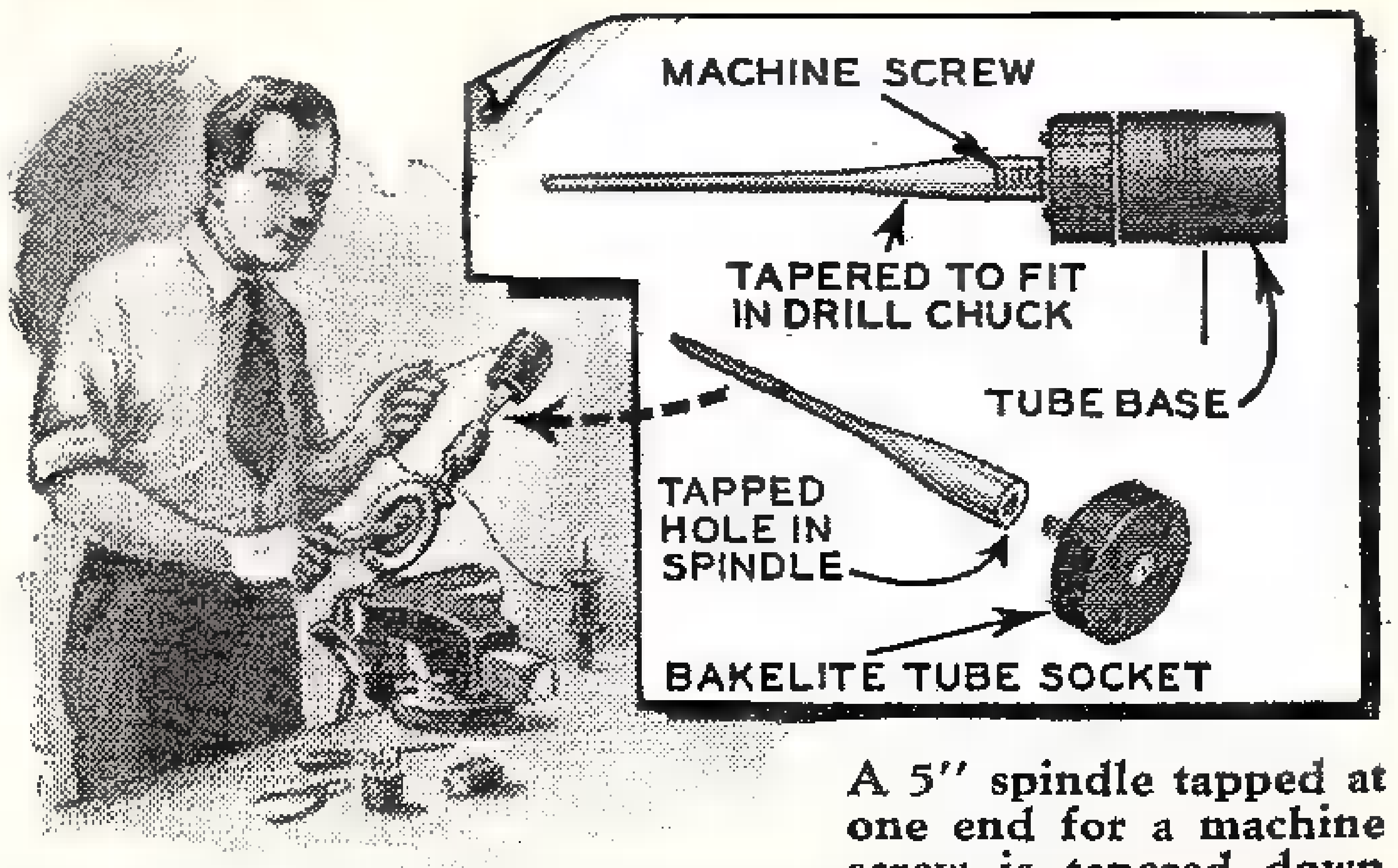
Easily Made Jig for Winding Radio Coils on Tube Bases

A SMALL winding arbor which can be rigged up in a few minutes to fit in a breast drill will enable you to wind short wave coils on tube bases in but a fraction of the time required to do the job by hand.

Turn down one end of a five inch steel or hardwood spindle to a size which will fit in an ordinary breast drill. The other end can be tapered out to about twice this thickness, and should be drilled and tapped to take a machine screw.

A bakelite tube socket having a center hole is fastened to the thick end of the spindle with a machine screw, as shown.

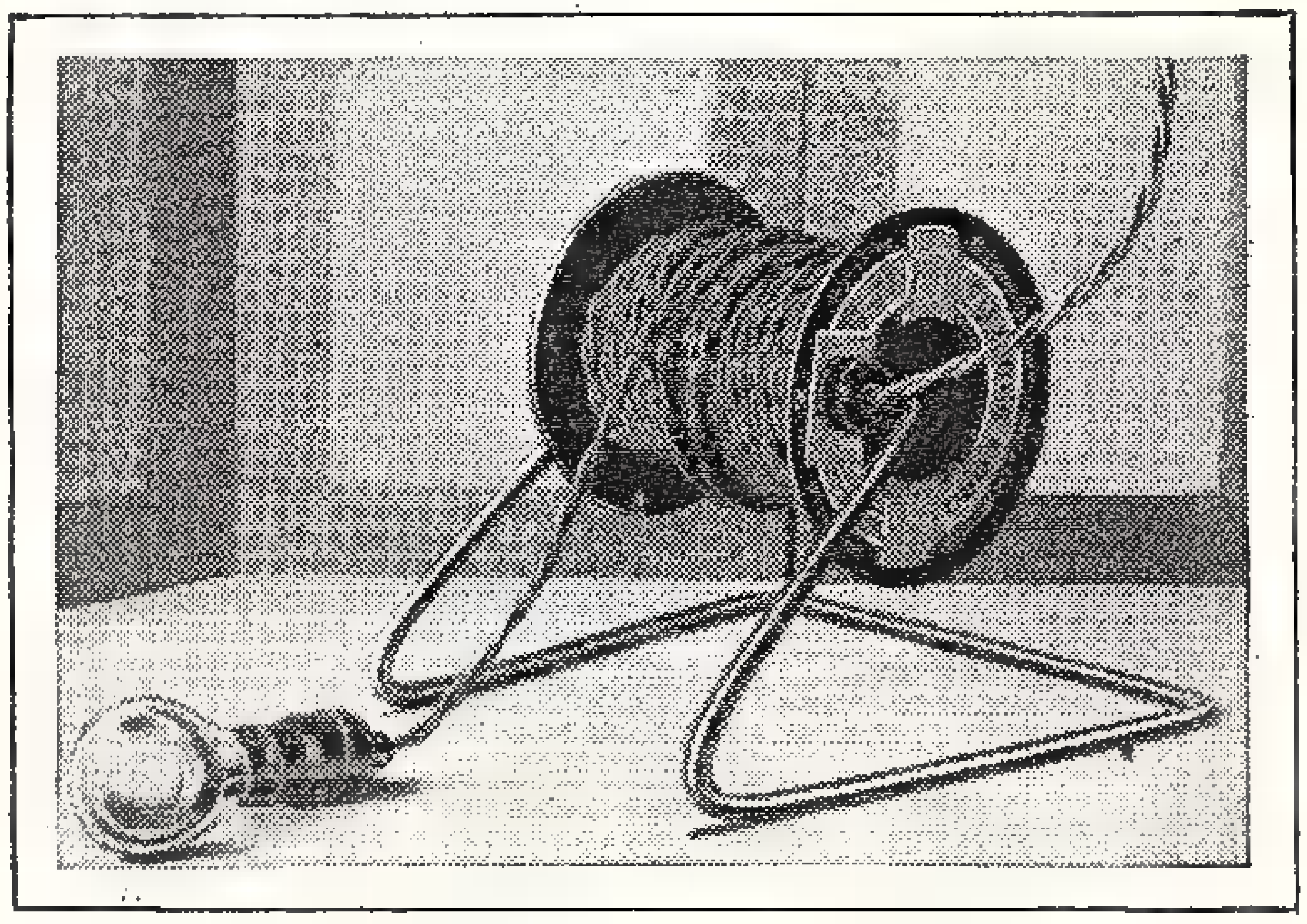
With the tube base in position in the socket, it is a simple matter to put the spindle in the chuck and fasten the breast drill in a vise. The wire is fed and guided with one hand while the drill is turned with the other.



A 5" spindle tapped at one end for a machine screw is tapered down to fit in a breast drill chuck. Tube socket is fastened to end of spindle. Tube base coils are pushed in socket for winding.

Handy Reel for Electric Cord

TO MAKE a portable reel for that extension cord, bend a piece of ½" iron rod as shown, to form the stand. Bore a hole in one end of the spool, fit in a small base receptacle, and connect one end of the extension cord to the receptacle. Wind the cord on the reel, and attach an ordinary lamp socket. Spool of wire should be mounted to turn freely to avoid kinks.



Handy portable reel pays out any length of extension cord.

Burning Insulation From Wire

FOR transmitters up to 25 watts, heavy copper wire may be used in place of copper tubing for inductance coils. No. 8 to 12 insulated wire may be used by coiling it up and burning insulation off in a fire. Remove wire from fire and immerse in cold water to soften. Polish wire, straighten, wind coil, and paint with transparent Duco.

Increase Magnetic Speaker Volume

THE output power of an ordinary magnetic speaker may be increased about one-third by adding D. C. magnetizing coils to increase the strength of the permanent magnet.

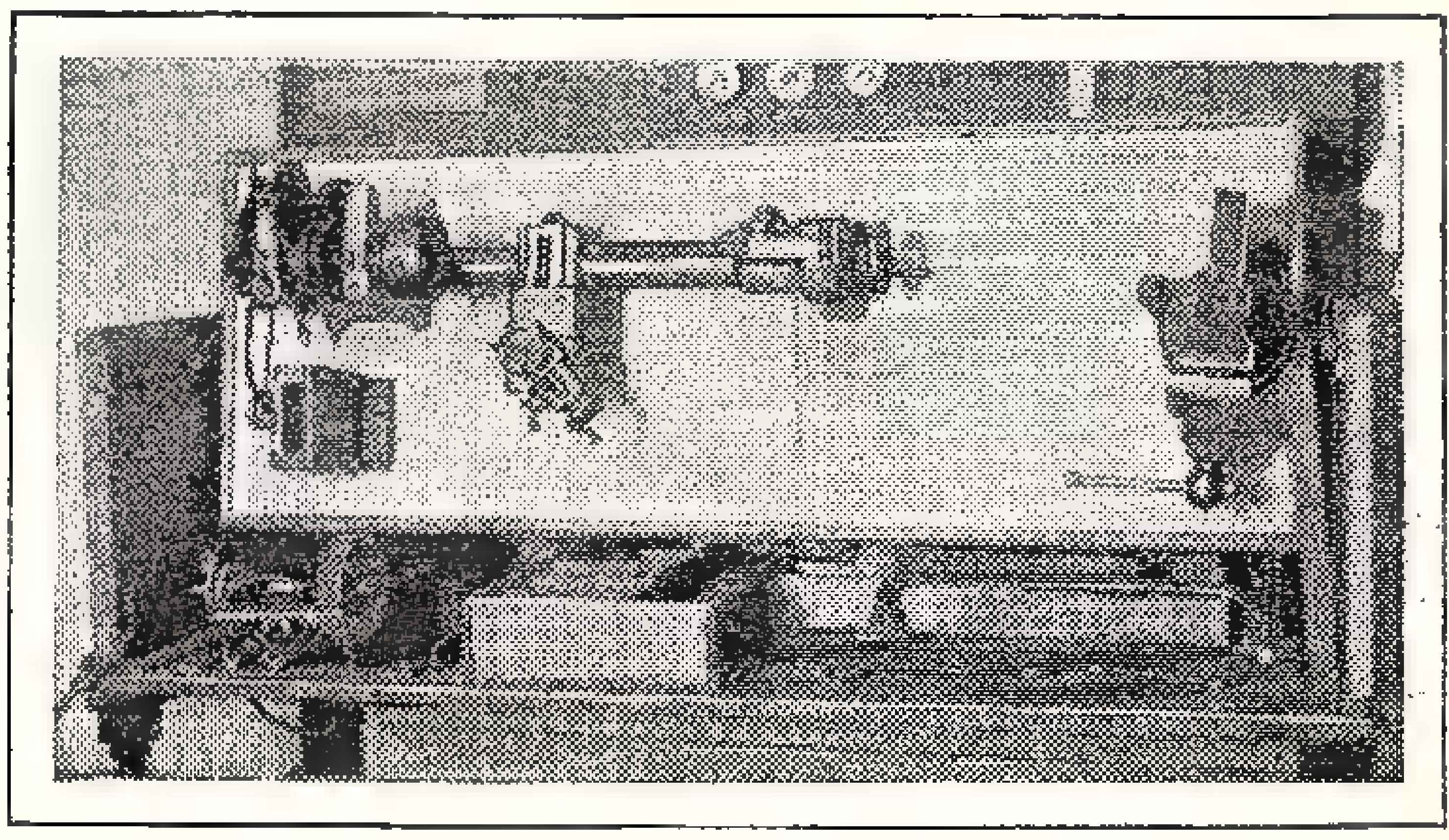
Carefully disassemble the speaker, and remove the large permanent magnet. Make two cardboard or gummed paper winding forms about one inch long, that will just slip over the magnet poles. Wind about 325 turns of No. 22 D. C. C. copper wire on each form, place windings on magnet, and connect each coil in turn to a 6-volt battery. With compass in front of a pole, needle should not deflect when current in that magnet coil is turned on. When correct coil connections are found, connect coils in series across a 6-volt battery, and replace magnet in speaker. Magnetic flux of coil then aids permanent magnet.

Lathe on Folding Table Top Is Big Help to Home Electrician, Radio Man

THE table top workshop shown to the right is an enormously handy thing for the man who builds radios or who likes to tinker with small metal parts such as boat engines, etc., in his spare time.

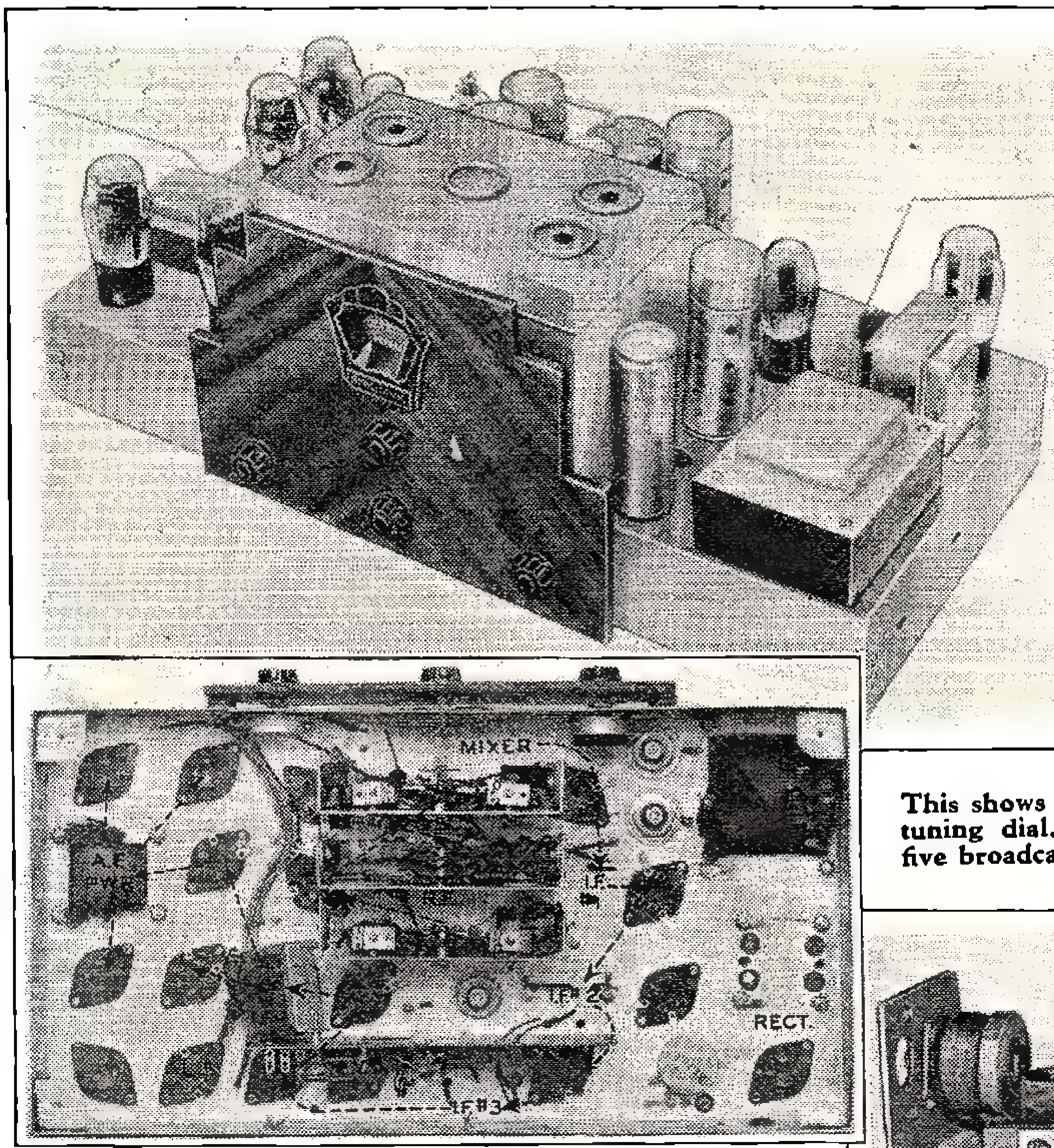
The table is a complete workshop, and can be installed in a bedroom to look like an ordinary piece of furniture. It consists of an ordinary four-legged table with a bottom and a top shelf. Instead of the bottom being on slides, it is permanently fastened to the legs, and the top on which the lathe and vise are installed so that they can slide up. See photo.

A grindstone, a small vise, hammer, nails and small bench tools are carried below.

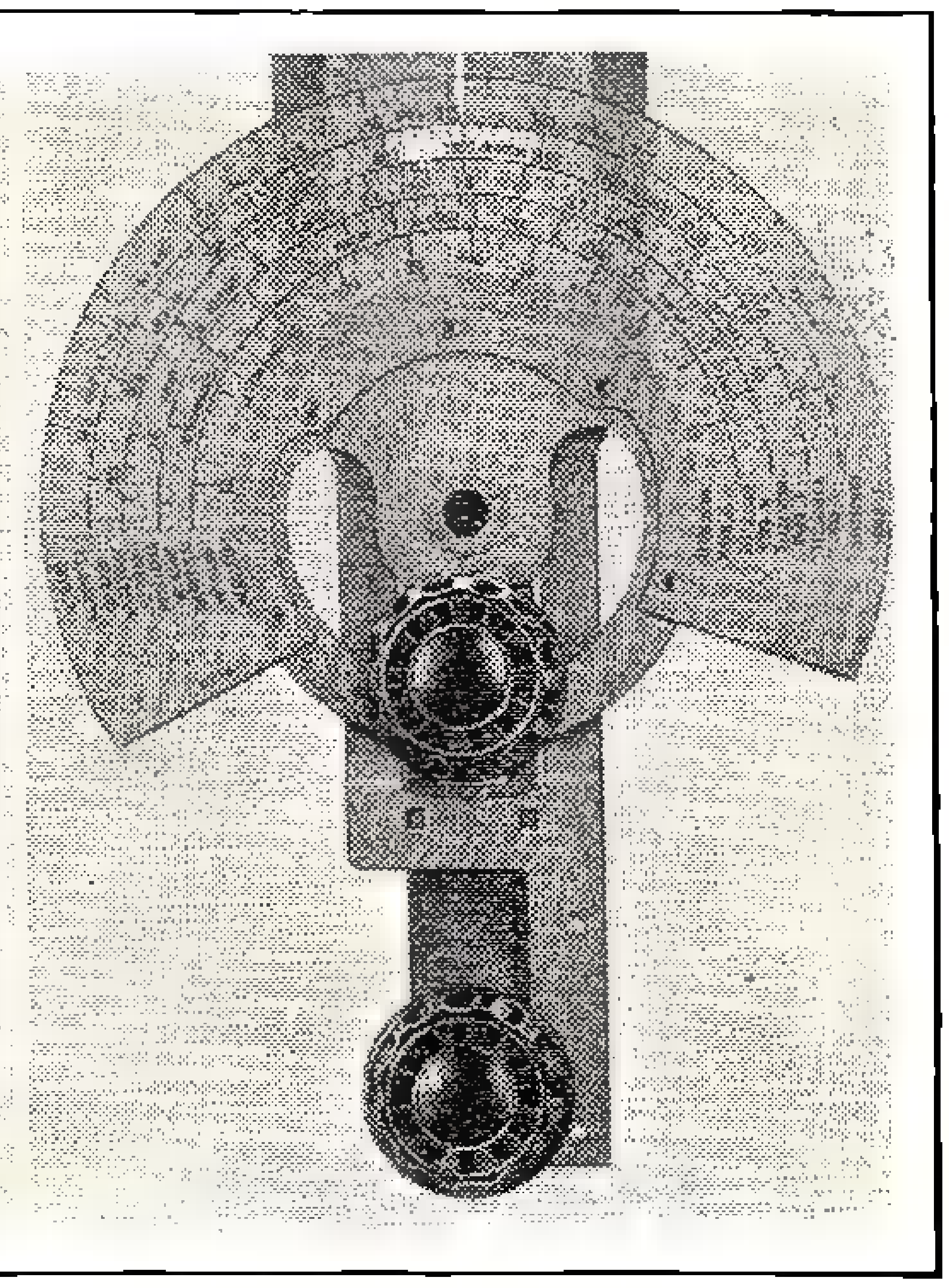


Handy metal-working shop can be set up in bedroom, where it is particularly handy at radio and light machine work.

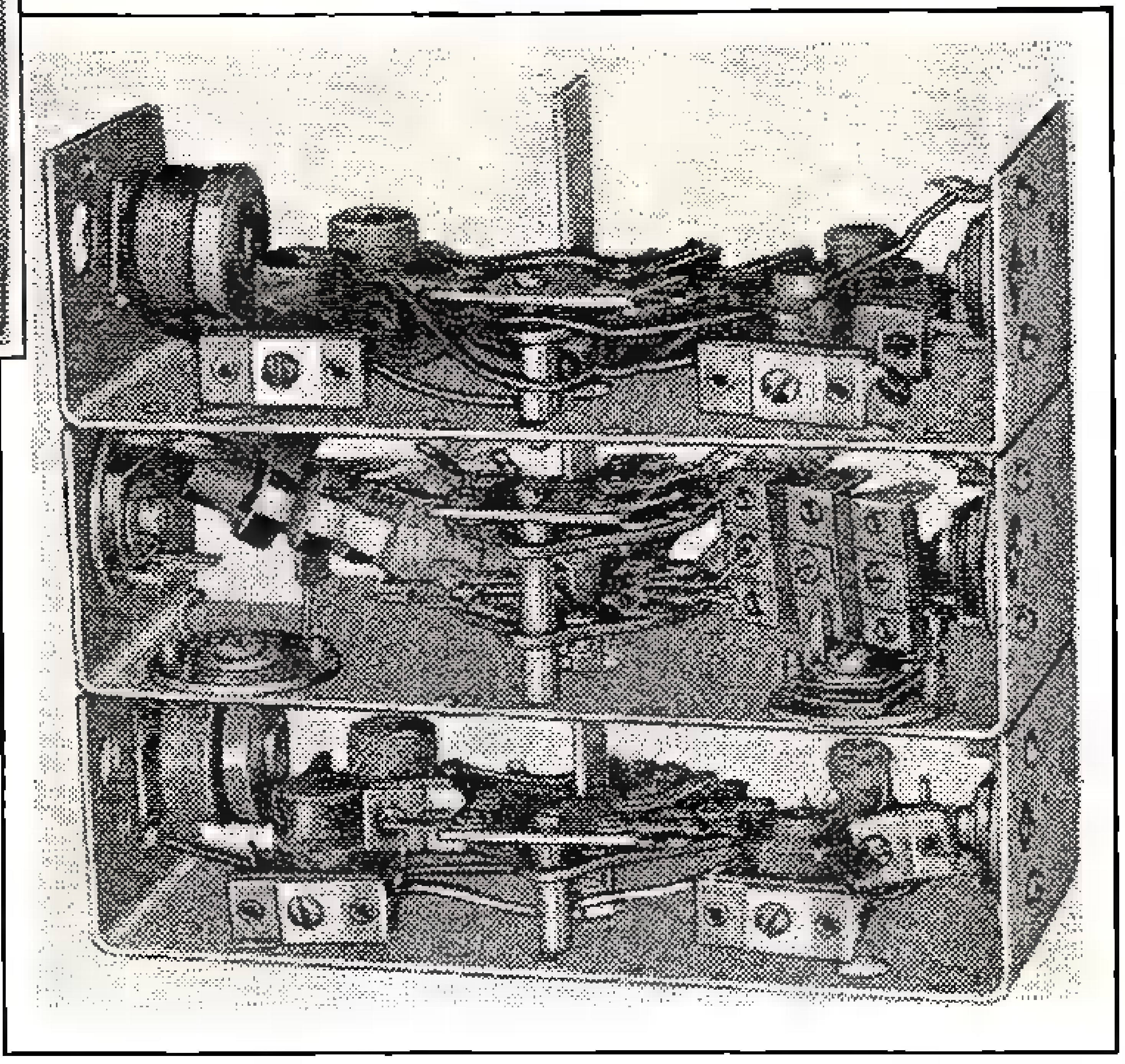
Radio Gets All Waves in One Set, Has Novel Features



The compact external panel is one of the features with which this new radio set bristles. At the top is a picture showing this compact 16-tube outfit, and at the bottom is a diagrammatic view of the chassis from the lower side, outlining placement of parts.



This shows the unique wave band selector switch and tuning dial. Lower knob switches into any one of five broadcast fields and upper knob does the tuning.



This shows the wave band switch which is so compactly designed as to take up very little space in the unique 16-tube all-wave radio.

THIS is news: manufacturers usually send to this magazine merely photos of their products. Not so the makers of the Midwest All-wave 16 and 9 tube radios. They send their product, which speaks eloquently.

Much to-do has been about in radio circles lately concerning combination all-wave sets. As a rule they are quite expensive. So naturally Modern Mechanix and Inventions staff were anxious to see what could be done by this new inexpensive arrival, quite different in form from the usual contribution.

Imagine the surprise of all concerned when the first station to be picked up was that of the liner Majestic in mid-Atlantic—station GFWV!

This was without an aerial, as the set was trundled to the nearest desk and attached to an improvised counterpoise!

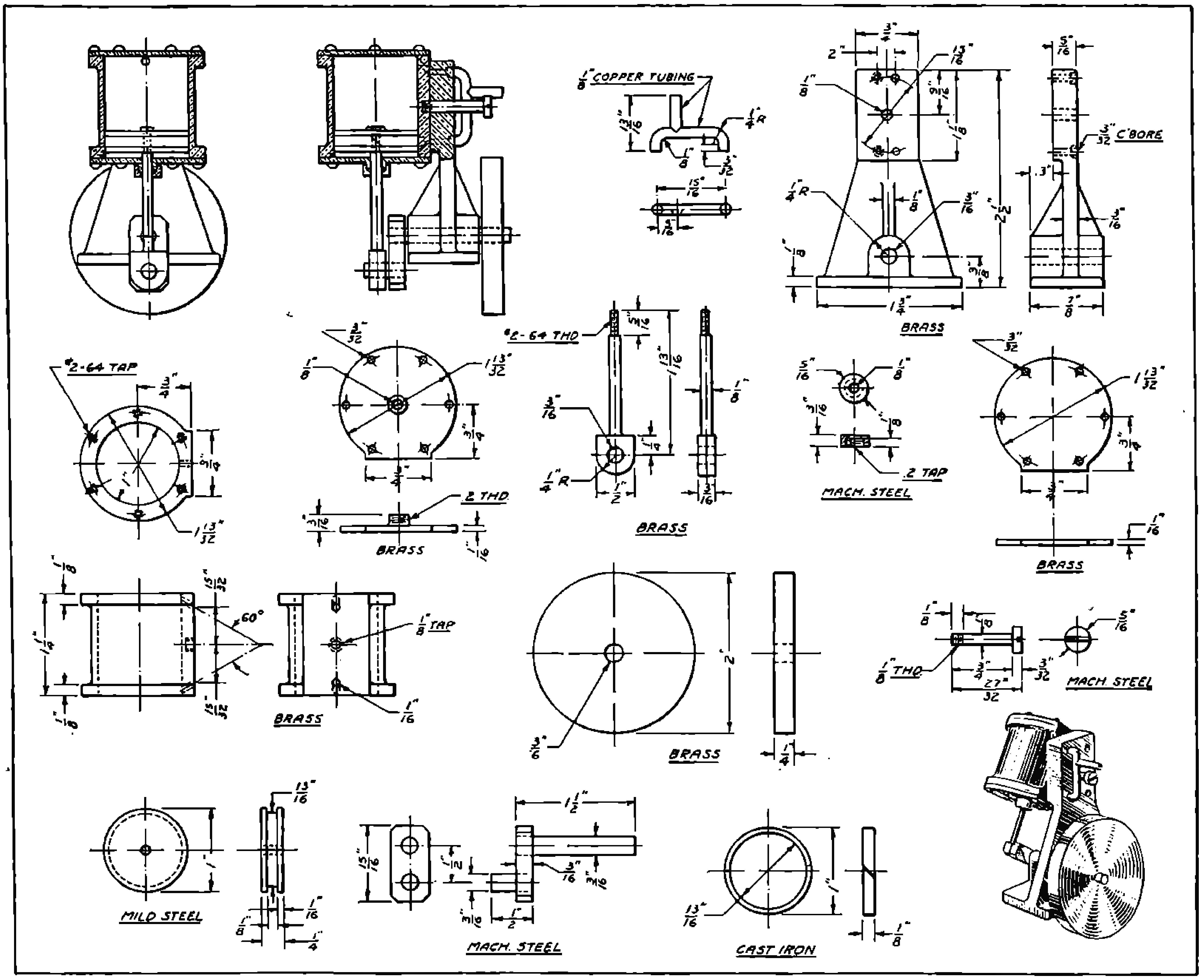
Subsequent tests have proved amazing range, splendid receptivity and tone, and razor sharp tuning.

The set is designed to run on alternating current of 105 to 120 volts, 60 cycle. The chassis rests on four rubber feet which have a tendency to damp out vibrations and microphonic noises.

The control board face is extremely simple, and the multiple function of the wave band selector switch accounts for this. By an ingenious mechanical arrangement five different circuits are tapped through the one switch. Tuning is done on one dial, and is very critical. There is a small pilot light behind the dial which illuminates the outline of the indicator on the wave band selector switch, and at the same time diascopically allows the numbers on the tuning dial to be easily read.

The set has a phone jack also. so that headphones can be used. The set is a joy to tune, as it has an automatic volume control which drowns out the noise level of local stations and swells weaker signals to normal strength. This most unique and versatile set is not expensive. It is sold by Midwest Radio Corp., Cincinnati, Ohio.

BUILD This WEE STEAM ENGINE



Any kind of a boiler from a pot type to a flash steam plant will run this elegant little design by a student of the Cornell Engineering College. The pattern work is just elaborate enough to be interesting, simple enough to be fun. Much of the manner of execution, such as thread sizes, materials, and so on, is left to the ingenuity of the model builder.

by N. A. WELCH

HUNDREDS have asked for small engine plans. This wee fellow is no toy, and should satisfy those who want an engine for a shop project, to power a model boat or "just to run."

It has been planned to fill this need rather than as an efficient or as a revolutionary machine.

Many of the details are left to the builder such as thread sizes, finish of parts and so forth. It is extremely sturdy and will stand lots of hard use.

It is constructed entirely of brass with few exceptions. We will go now to the details of construction.

The base or stand is a brass casting. The pattern can be made from whitewood, white pine, boxwood or mahogany. No allowance is left for shrinkage, but plenty, about one sixteenth (1/16) of an inch, is left on the surfaces to be machined for cuts. The reason why no allowance is made for shrinkage is because the casting is so small that the shrinkage will be negligible. The drawing gives the dimensions of the finished part, so this must be borne in mind when the patterns are made.

Wax Used in Castings

It is suggested that wax fillets be used on all the angles as these are the easiest to apply to small patterns and stand up very well, especially when only one or two castings are to be made. This process is done by first grinding a rod to the required spherical radius, that is the radius of the end equals the radius of the fillet. Heat the rod in a flame and press the wax into the angles.

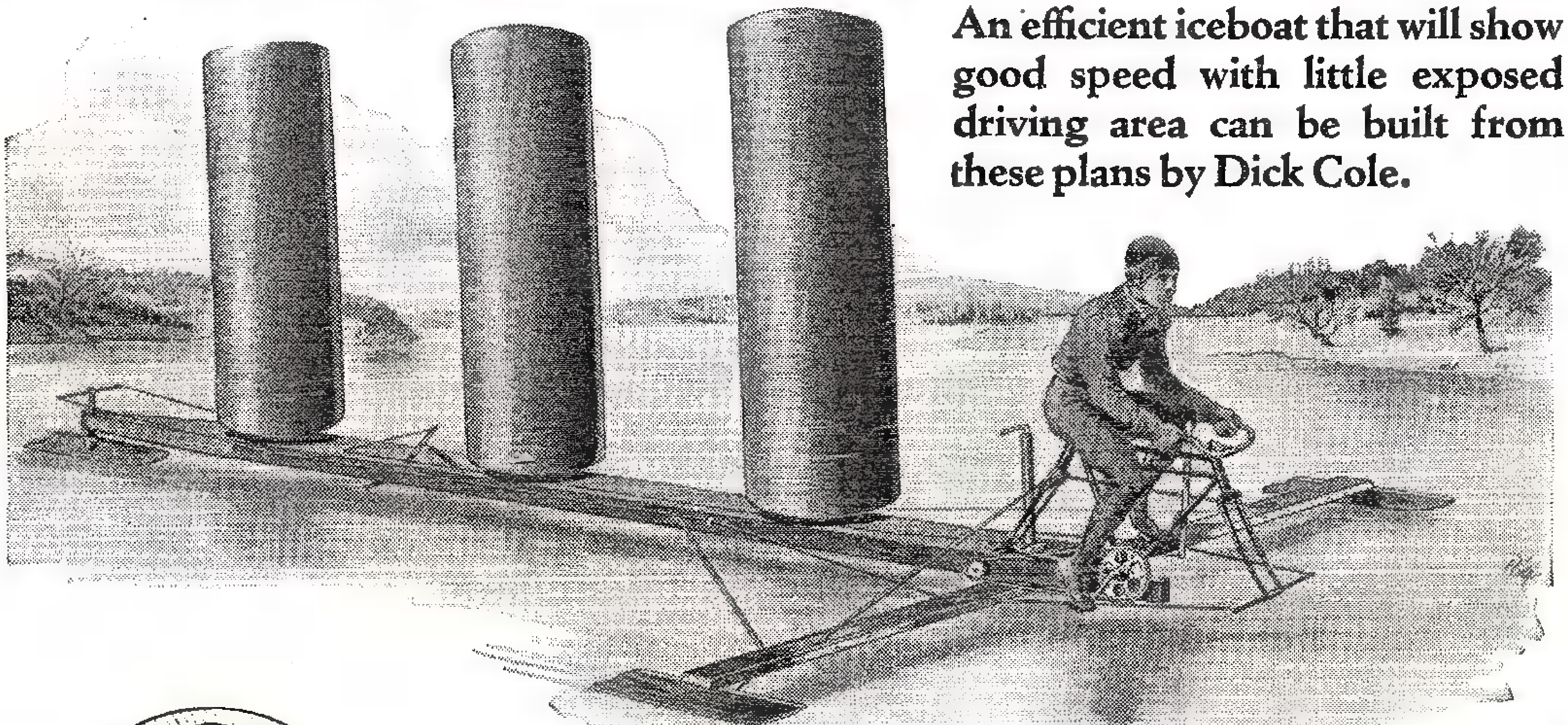
The machining of this piece can be accomplished in one of two ways. In either case the main bearing hole and the various holes in the cylinder bearing face must be laid off as per drawing.

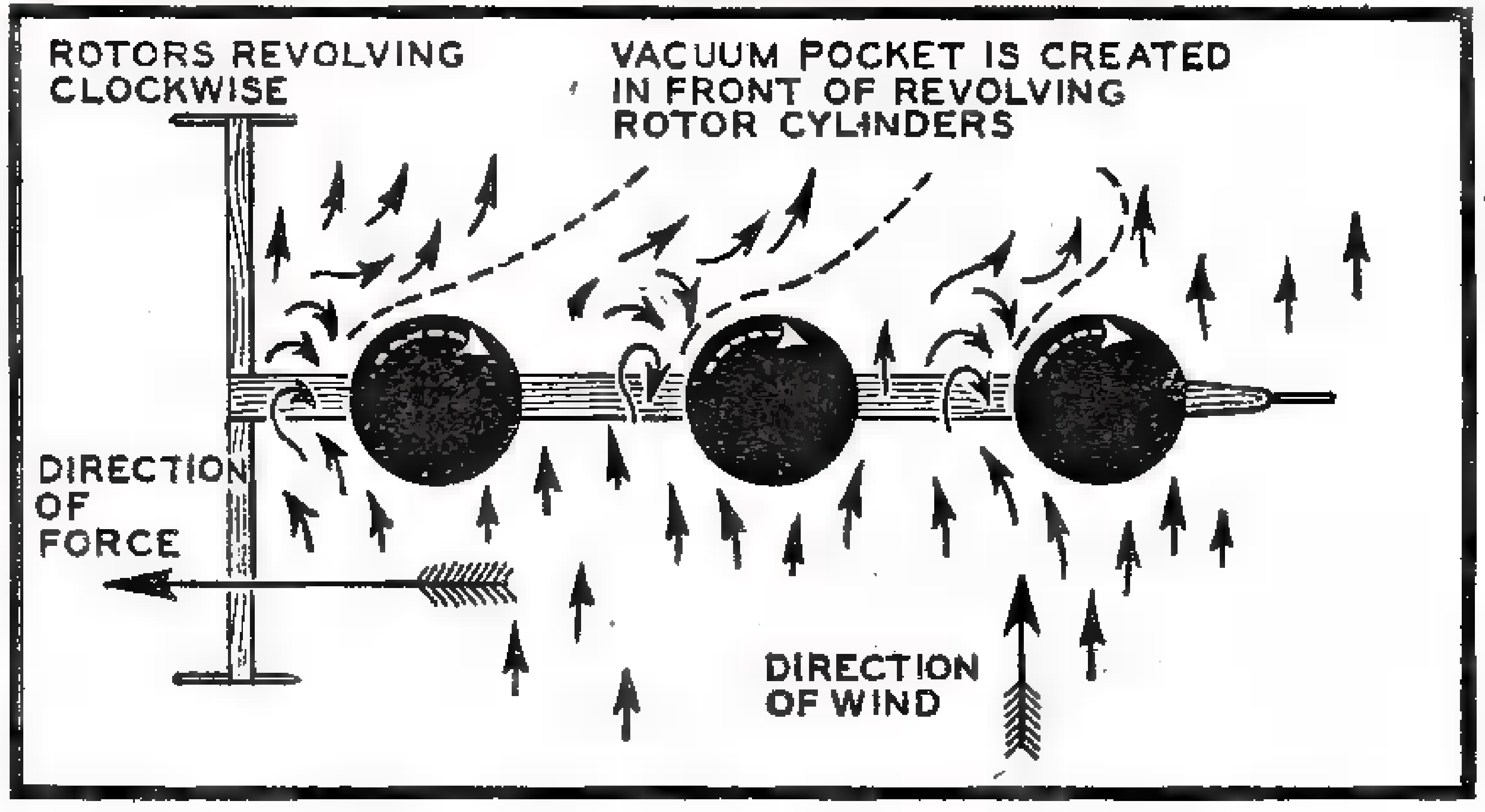
The best way to do the machining is to bolt the base to a milling attachment for the lathe, base down, after first filing the base flat. Then the holes may be drilled by putting a chuck on the headstock to hold

(Continued on page 124)

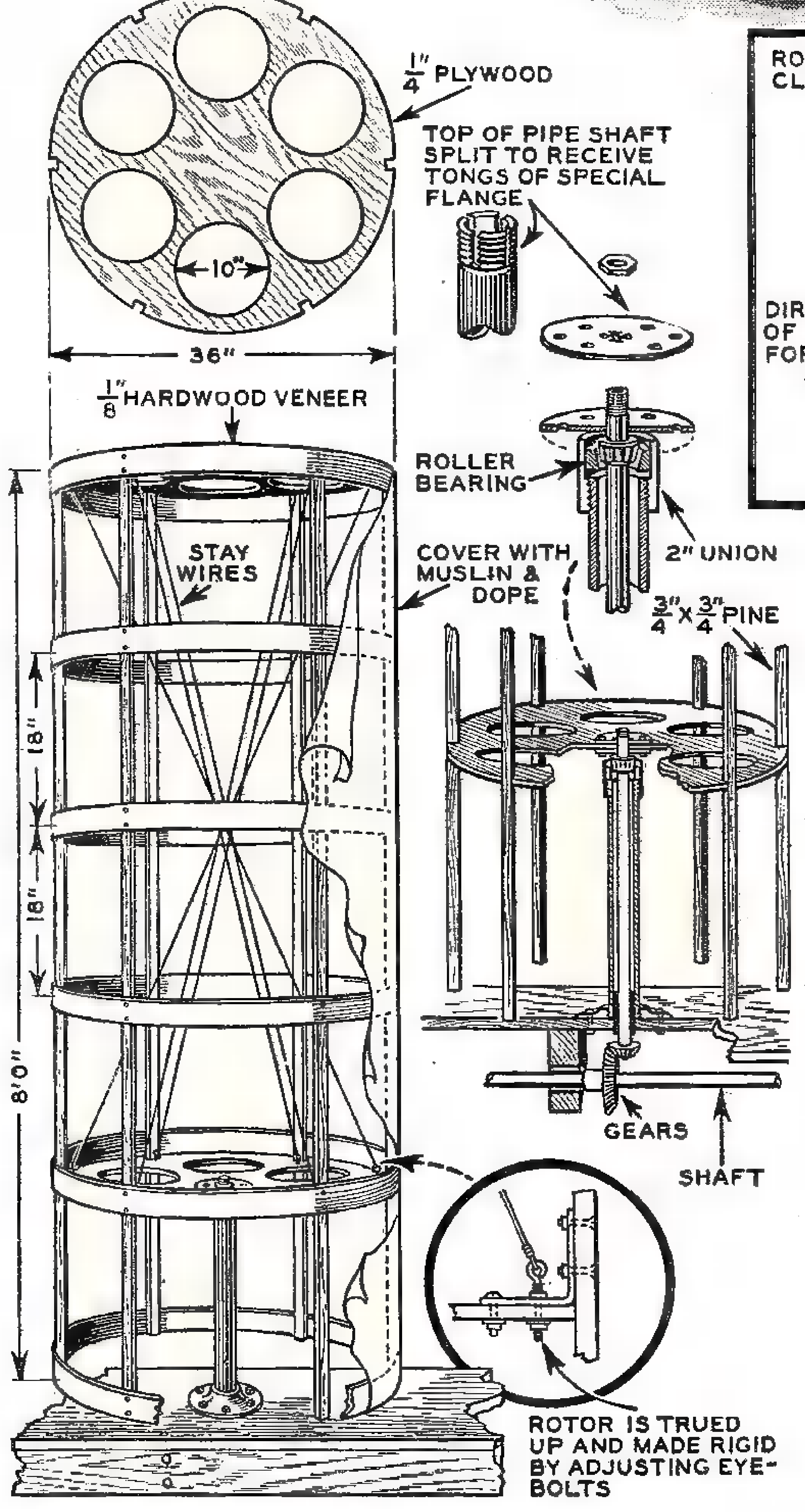
BUILDING a NOVEL

An efficient iceboat that will show good speed with little exposed driving area can be built from these plans by Dick Cole.




ROTORS REVOLVING CLOCKWISE
VACUUM POCKET IS CREATED IN FRONT OF REVOLVING ROTOR CYLINDERS
DIRECTION OF FORCE
DIRECTION OF WIND

The diagram above explains the rotor driving principle. One can sail into the wind on a fairly sharp tack, but must employ a reversing gear to spin the rotors in opposite rotation in order to tack back the same way.


$\frac{1}{4}$" PLYWOOD
10"
36"
TOP OF PIPE SHAFT SPLIT TO RECEIVE TONGS OF SPECIAL FLANGE
$\frac{1}{8}$" HARDWOOD VENEER
ROLLER BEARING
2" UNION
STAY WIRES
COVER WITH MUSLIN & DOPE
$\frac{3}{4}$"x$\frac{3}{4}$" PINE
18"
18"
8'0"
GEARS
SHAFT
ROTOR IS TRUED UP AND MADE RIGID BY ADJUSTING EYE-BOLTS

The rotors are no more difficult to build than big box kites, and are fabricated from veneer, old pipe fittings, wire stays and doped muslin to give the barrel effect.

HERE is something which will tickle the fancy of the ultra-modern experimenter who delights to delve into unplumbed depths—*a rotor iceboat.* Readers of this magazine will have read of the rotor ship built in Germany several years ago. While the principle of operation of this ship was scientifically sound—as proved by practical experiments—commercially, it was a complete flop. No "wind-jammer" of any kind can possibly oust the steamship and the modern motor-ship from the salty waves.

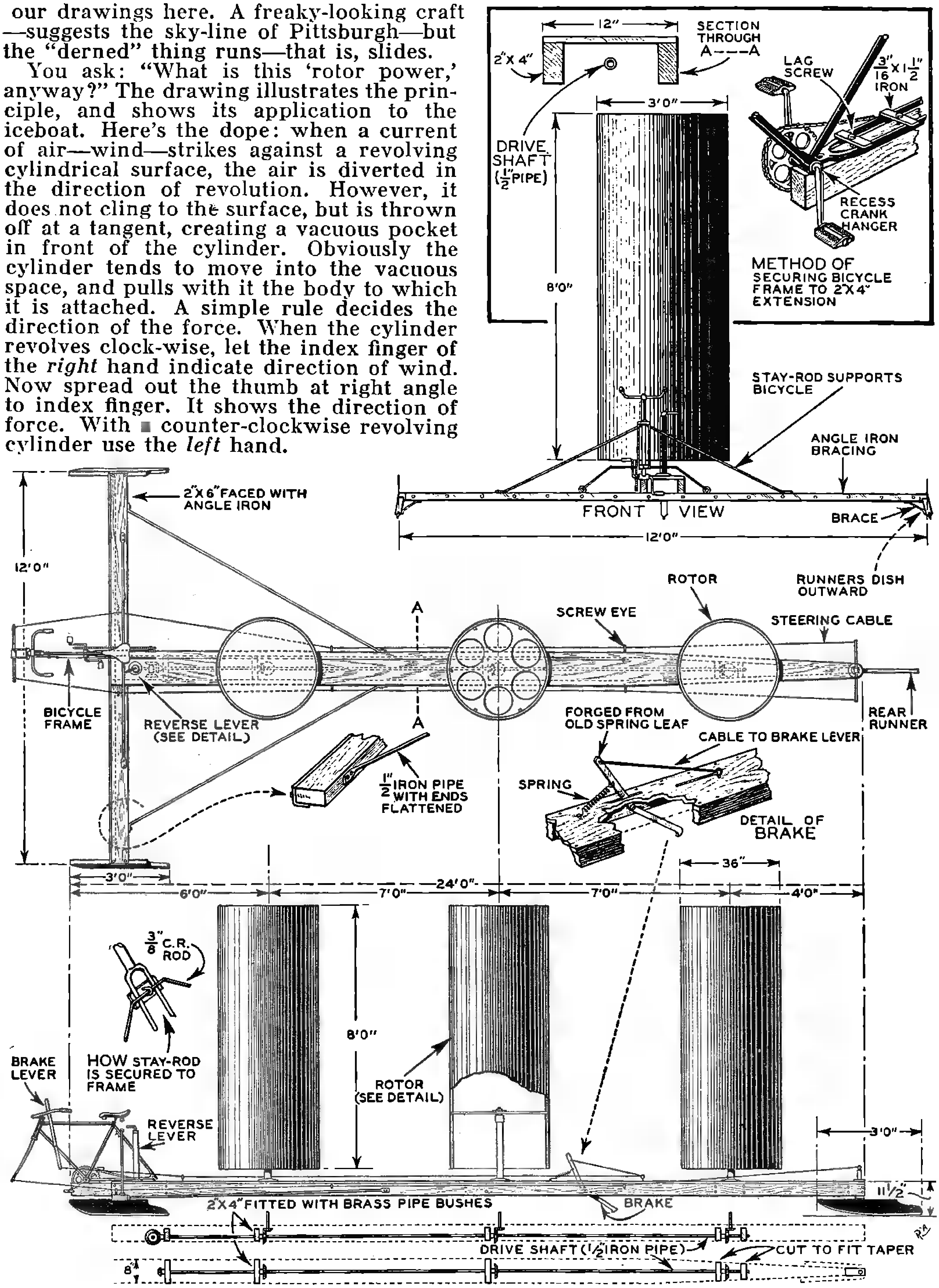
Might as well expect domestic zebras to restore the popularity of equine-drawn vehicles. Nevertheless the German rotor ship did function mechanically as intended, albeit was dependent for its actual propelling power upon the wind, just as much so as an old "Yankee clipper." But it *did* move through the water by "rotor power" application, was maneuverable, and it cruised. If "rotor power" can move a cumbersome hulk through the water, how much more readily can it propel a practically frictionless iceboat over the shimmering ice! And so we have it in

Rotor ICEBOAT

by DICK COLE

our drawings here. A freaky-looking craft —suggests the sky-line of Pittsburgh—but the "derned" thing runs—that is, slides.

You ask: "What is this 'rotor power,' anyway?" The drawing illustrates the principle, and shows its application to the iceboat. Here's the dope: when a current of air—wind—strikes against a revolving cylindrical surface, the air is diverted in the direction of revolution. However, it does not cling to the surface, but is thrown off at a tangent, creating a vacuous pocket in front of the cylinder. Obviously the cylinder tends to move into the vacuous space, and pulls with it the body to which it is attached. A simple rule decides the direction of the force. When the cylinder revolves clock-wise, let the index finger of the *right* hand indicate direction of wind. Now spread out the thumb at right angle to index finger. It shows the direction of force. With a counter-clockwise revolving cylinder use the *left* hand.


12"
SECTION THROUGH A---A
2"X 4"
DRIVE SHAFT (1/2" PIPE)
3'0"
8'0"
LAG SCREW
3/16" X 1 1/2" IRON
RECESS CRANK HANGER
METHOD OF SECURING BICYCLE FRAME TO 2"X 4" EXTENSION
STAY-ROD SUPPORTS BICYCLE
ANGLE IRON BRACING
FRONT VIEW
BRACE
12'0"
RUNNERS DISH OUTWARD
2"X 6" FACED WITH ANGLE IRON
12'0"
A
A
ROTOR
SCREW EYE
STEERING CABLE
BICYCLE FRAME
REVERSE LEVER (SEE DETAIL)
REAR RUNNER
FORGED FROM OLD SPRING LEAF
CABLE TO BRAKE LEVER
1/2" IRON PIPE WITH ENDS FLATTENED
SPRING
DETAIL OF BRAKE
3'0"
36"
6'0"
7'0"
24'0"
7'0"
4'0"
3/8" C.R. ROD
HOW STAY-ROD IS SECURED TO FRAME
8'0"
ROTOR (SEE DETAIL)
BRAKE LEVER
REVERSE LEVER
3'0"
11 1/2"
2"X 4" FITTED WITH BRASS PIPE BUSHES
BRAKE
DRIVE SHAFT (1/2" IRON PIPE)
CUT TO FIT TAPER
8"

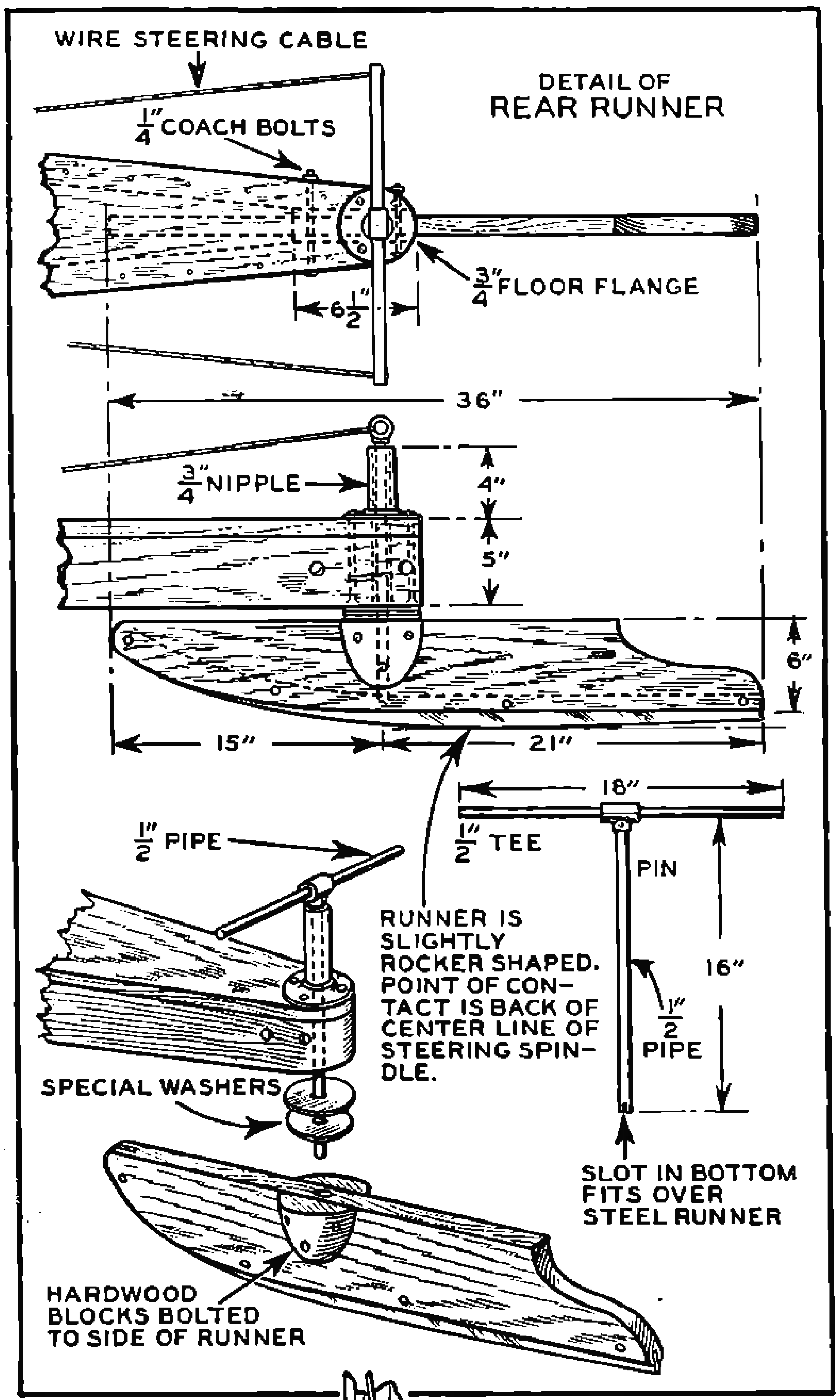
The disposition of the rotors, the size of the iceboat, and the driving details are shown in the drawings above. There is another detail drawing which shows the reverse mechanism used on opposite tacks. Note construction of the brake.

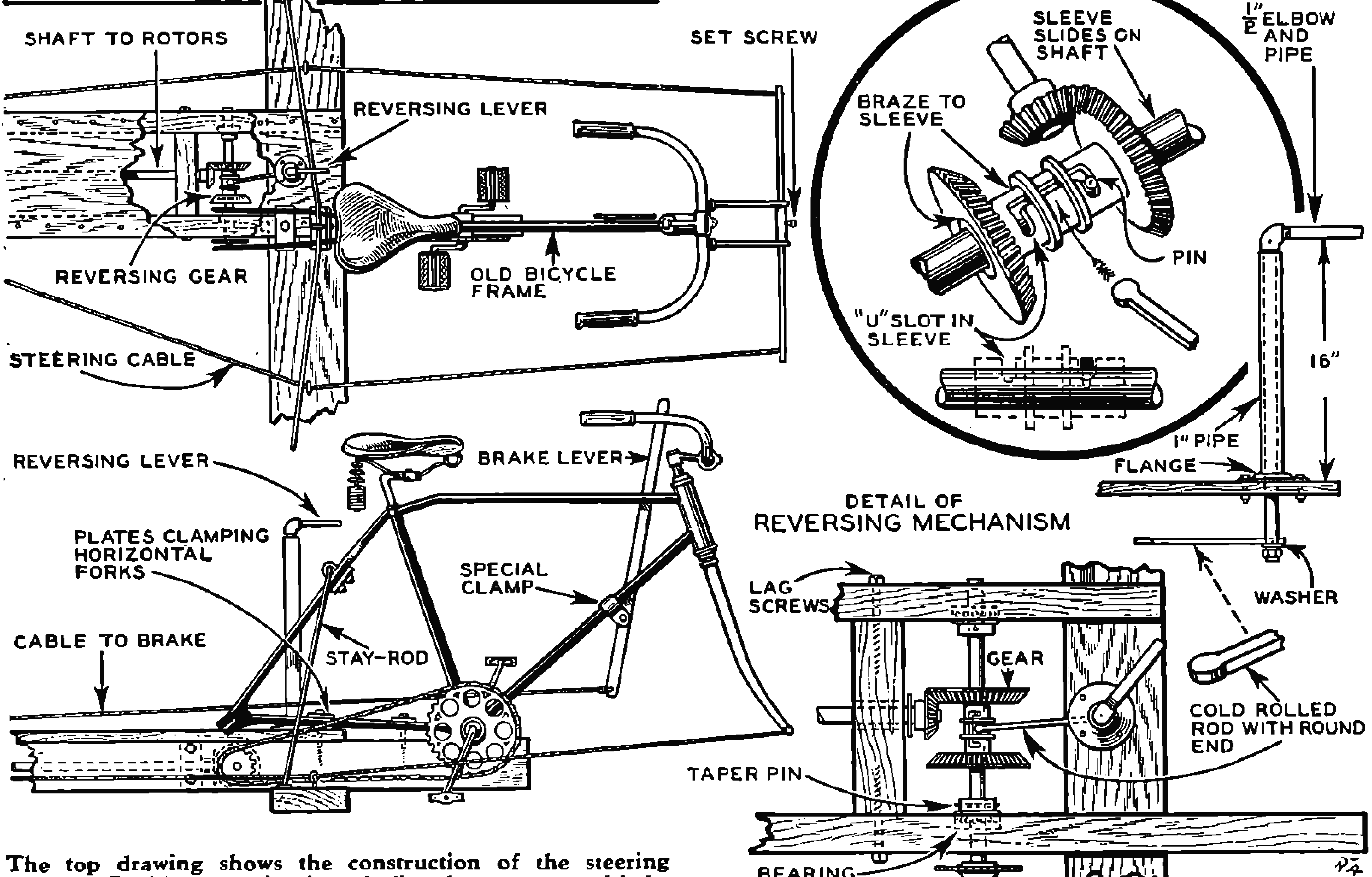
Reverse and Pedaling Machinery

From the foregoing one will have learned what "rotor power" is all about. Now we will apply it to the iceboat. Let it be said right now that the amateur builder need not "shy" at the construction; it is not at all complicated nor is it costly. A bicycle is temporarily requisitioned to provide the motive power; the shafting, for the most part, is ½" pipe (second-hand, at that); the bevel gears can be bought at any auto wrecking yard for "six bits"; the rotors are a skeleton frame-work covered with muslin, and "doped". A few miscellaneous pipe fittings complete the list of material.

From the plan and elevations the builder can readily construct the frame, and can mount the bicycle—sans wheels—on the projecting right front end of the frame. It will be seen that the drive shaft, with its supporting cross members, is built up as a separate assembly, and afterward slipped up between the 2 by 4's of the main frame and secured with ½" lag-screws. All the bevel gears on the drive-shaft are "spider" gears from old differentials. The gears are bored out so that they are a light driving fit on the ½" pipe which serves as the shaft. Their mating gears are on the vertical shafts of the rotors. Before permanently pinning any of the gears to the shaft, it is well to try them out and determine their actual pitch line first.

The brake is incorporated into the main frame assembly, and should be built into the frame at this time. Its construction and operation is so simple that it needs no elaboration: The drawing shows the simple clip which serves as the fulcrum for the brake lever.


WIRE STEERING CABLE
DETAIL OF REAR RUNNER
1/4" COACH BOLTS
3/4" FLOOR FLANGE
6 1/2"
36"
3/4" NIPPLE
4"
5"
6"
15"
21"
18"
1/2" PIPE
1/2" TEE
PIN
16"
1/2" PIPE
RUNNER IS SLIGHTLY ROCKER SHAPED. POINT OF CONTACT IS BACK OF CENTER LINE OF STEERING SPINDLE.
SPECIAL WASHERS
SLOT IN BOTTOM FITS OVER STEEL RUNNER
HARDWOOD BLOCKS BOLTED TO SIDE OF RUNNER


SHAFT TO ROTORS
REVERSING LEVER
SET SCREW
REVERSING GEAR
OLD BICYCLE FRAME
STEERING CABLE
SLEEVE SLIDES ON SHAFT
1/2" ELBOW AND PIPE
BRAZE TO SLEEVE
PIN
"U" SLOT IN SLEEVE
16"
1" PIPE FLANGE
REVERSING LEVER
BRAKE LEVER
DETAIL OF REVERSING MECHANISM
PLATES CLAMPING HORIZONTAL FORKS
SPECIAL CLAMP
LAG SCREWS
WASHER
CABLE TO BRAKE
STAY-ROD
GEAR
COLD ROLLED ROD WITH ROUND END
TAPER PIN
BEARING

The top drawing shows the construction of the steering runner. Rudder post is riveted directly to runner blade. Details below show construction of reversing mechanism, which is extremely simple and easy to build and should deter no one from building this big dollar's worth of fun.

We will now take up the construction of the runners for the iceboat. One drawing shows the front runners. The runner body proper is cut from a piece of selected maple or oak 1"x6"x36". A 2" groove 3/16" wide is cut on the lower edge of the runner. This can be readily done on a circular saw. Again one visits the auto junkman and obtains three old spring leaves 3/16"x2½" and over 40" long. Any blacksmith can quickly forge these as shown in the insert drawing. Also drill the holes and then re-temper.

Note particularly that the runners are dished outward 1". This adds strength to the construction and brings a keen edge in contact with the ice to prevent side slipping. The runners are secured to the cross-member of the frame with 5/16" lag-screws, and still further re-inforced with a ⅛" angle-plate underneath.

Rudder Runner

Now we come to the rear runner, which, of course, serves as rudder. For the most part, the construction parallels that of the front runners. However, the body is cut from 1½" stock and the steel runner is slightly "rockered" to facilitate steering. Note the sectional conical blocks bolted to the sides of the runner. These are to give a greater surface for the swivel washers. The rear elevation shows clearly how a ¾" floor flange and 4" nipple serve as a housing for the ½" rudder shaft. Note detail of rudder shaft. Note how the notch in the bottom rivets over the steel runner assuring rigidity. An essential point in the rear runner construction is that the point of contact with the ice is *back* of the center-line of the rudder shaft.

Now for the rotors themselves! The drawings present the construction so clearly that little need be said in addition. Particular attention is called to the ball (or roller) bearings at the top of the drive-shaft housing. The housing itself is a 24" length of 2" pipe held in a floor flange. A 2" union at the top is machined out to receive a front wheel bearing from a junked car (page the junkman again).

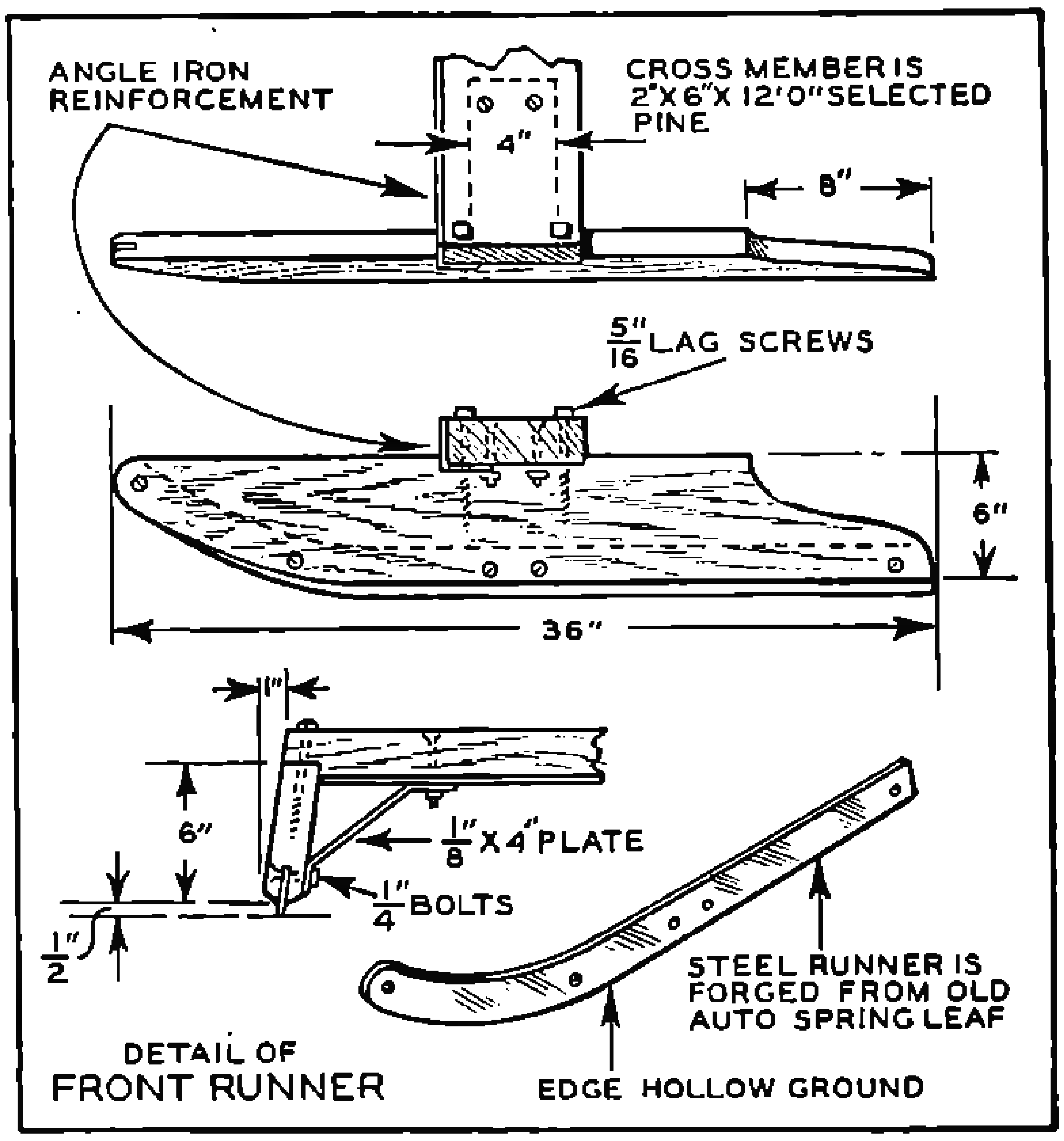
Note the special flanges, which secure the rotor disk to the drive shaft. These can be cut out with saw, chisel, and file. The holes are cut out of the plyboard disk solely to lighten rotor.

Rotor Covering

Also depicted are reinforcement angle brackets and the eye-bolts with which the stay-wires are adjusted. The frame is accurately trued up before the muslin covering is put on. Unbleached muslin is the covering. After being stretched on it is sprayed with water. Upon drying out it will shrink "as tight as a drum." It is then sprayed with airplane dope or lacquer. A finishing coat of aluminum paint enhances the appearance.

Now we come to a very essential factor in the construction: means of reversing the direction of revolution of the rotors. This is as essential as swinging the boom of a sail to catch the wind at the proper angle. In fact it serves a similar purpose.

Details of Runner Bracing



The method of bracing the front and side runners, as well as construction of the blade itself is shown here.

The details of the reversing gear are fully shown. It will be seen to be the acme of simplicity. First note how the original chain and rear sprocket of the bicycle are re-located to drive the cross-shaft. If the original bike sprocket is used it will probably have to be welded or brazed to the end of cross-shaft. However, any of the "stock gear" manufacturers make sprockets with a hub which can be pinned or keyed to the shaft.

Note how old front wheel bearings (page Ikey again) support the cross-shaft. Not only do these provide frictionless bearings, but they take up the thrust of the bevel gears as well.

It will be seen that the driving gears of the reverse gear are brazed to a sleeve which is free to slide upon the drive shaft. A hardened ⅜" pin screwed in the shaft engages a U slot in the sleeve. To reverse the gears, the pilot momentarily back-pedals on the bicycle. This throws the pin out of the slot parallel with the circumference of the sleeve. With the reverse level, within convenient reach of the pilot, the gear sleeve is moved so that the pin engages in opposite slot. Simple? What!

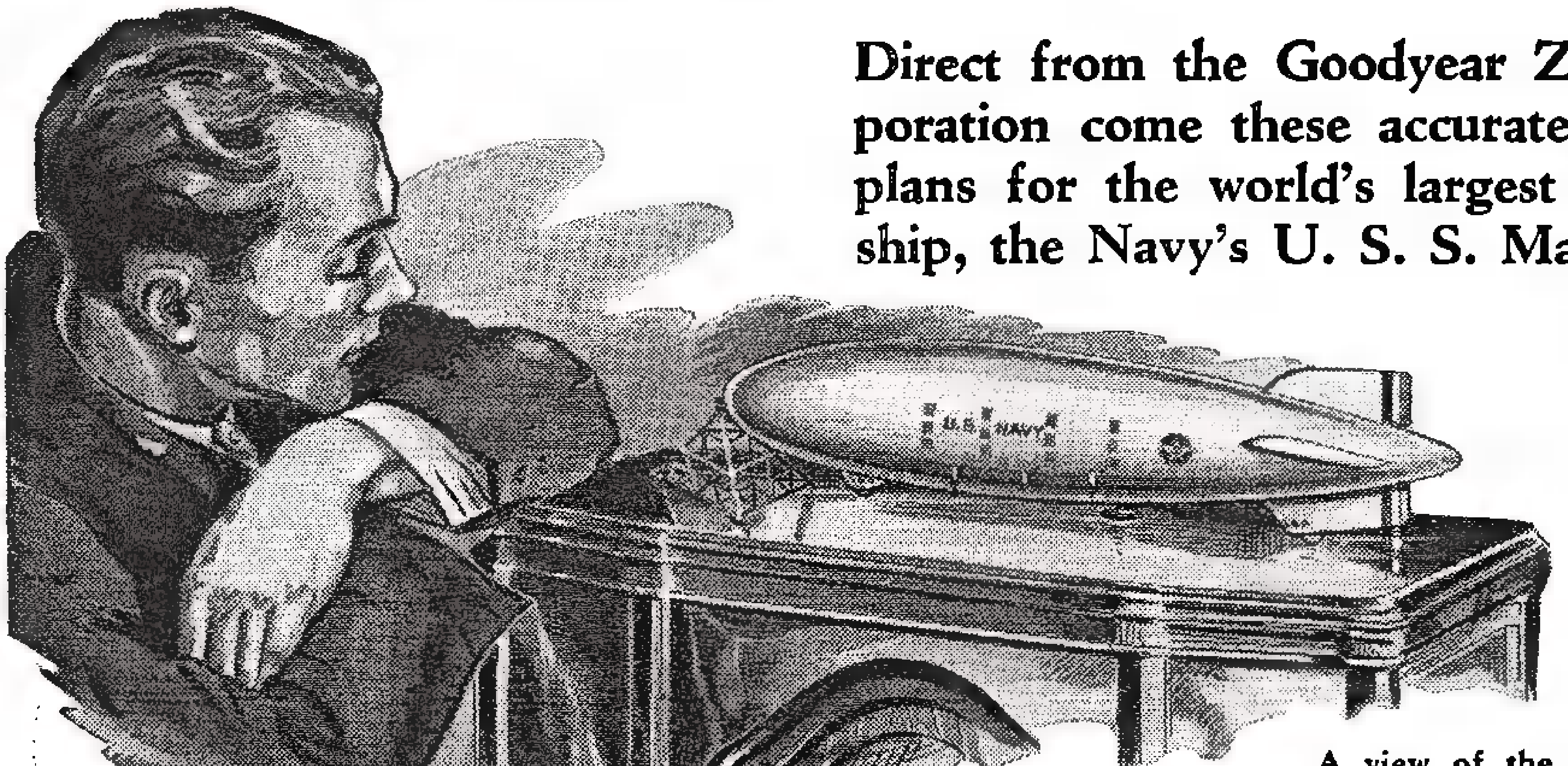
There's your *rotor iceboat*. Now go it. All you need is a fairly smooth ice surface and a 15, or more, mile an hour wind. Obviously one needs a cross wind, but, nevertheless, the rotor iceboat can be brought "close into the wind" the same as any wind-jammer. The pilot will quickly learn the peculiarities of rotor sailing from experience. It requires very little muscular effort to maintain the rotation of the rotors. They should revolve 200, or more, revs. per minute.

Build This Scale Model of

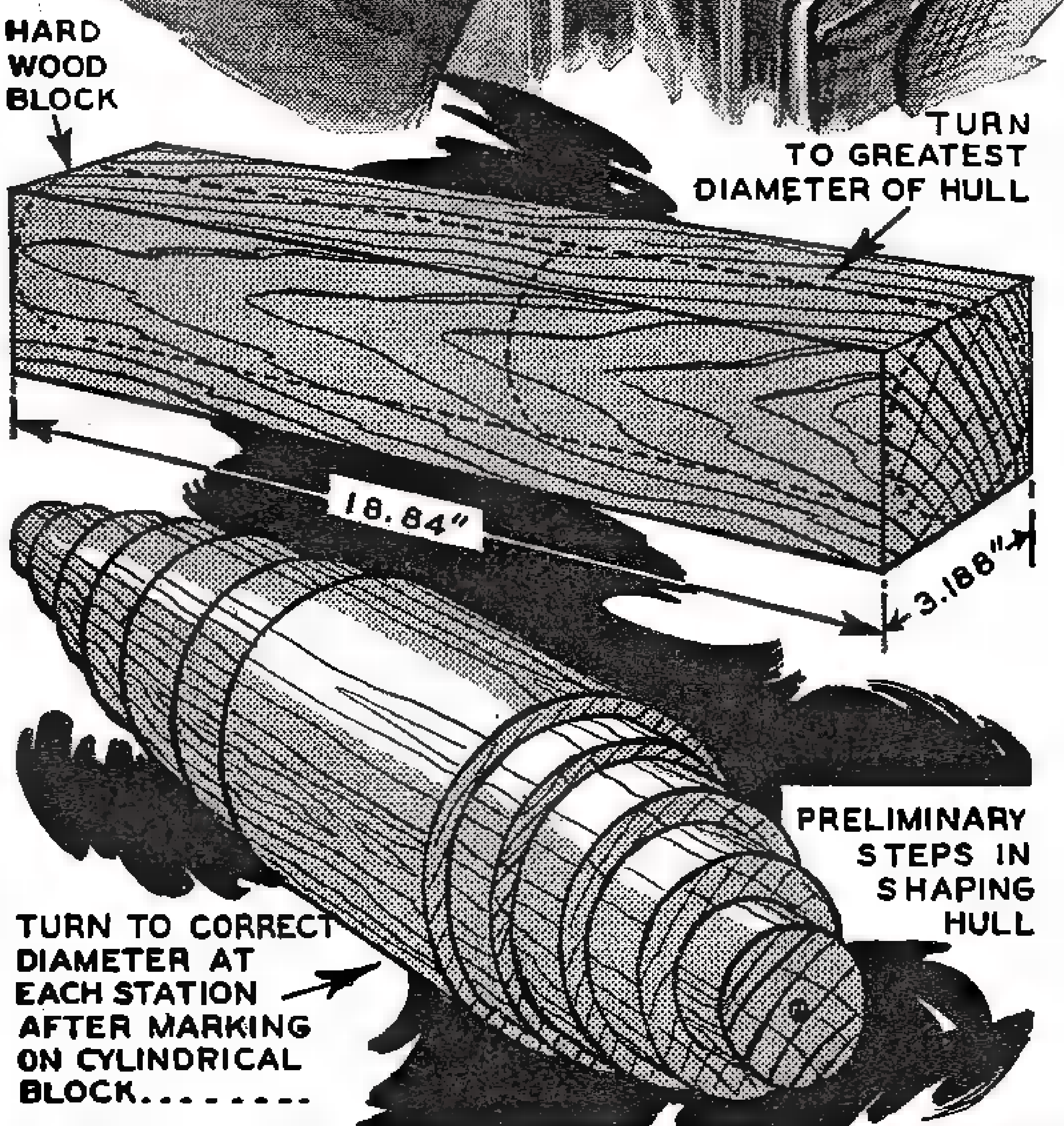
Direct from the Goodyear Zeppelin Corporation come these accurate scale model plans for the world's largest dirigible airship, the Navy's U. S. S. Macon.

by

J. EARLE MILLER



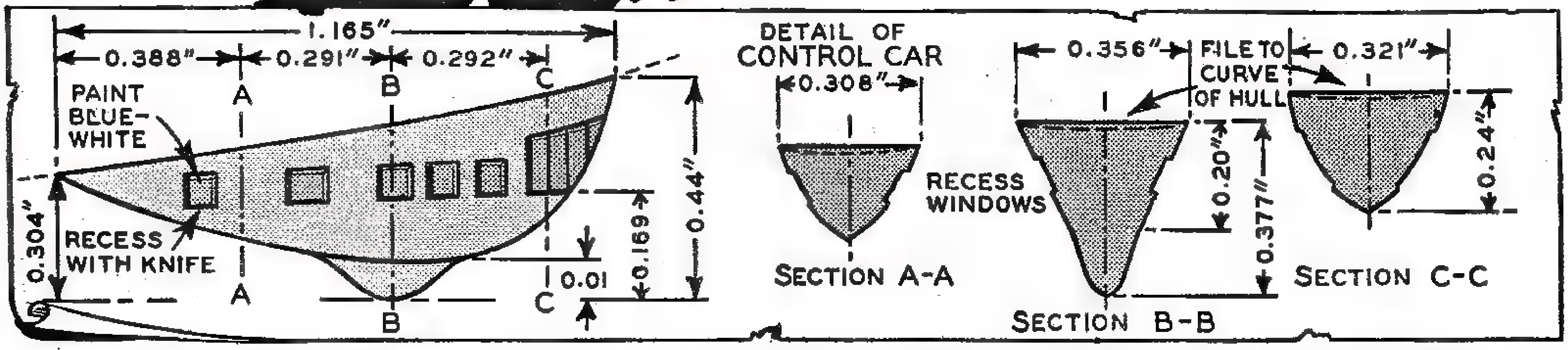
A view of the completed model, as it is supported on the mantel by its portable mooring mast, by the bumper under the lower vertical fin, and by a length of bus wire.


HARD WOOD BLOCK
TURN TO GREATEST DIAMETER OF HULL
18.84"
3.188"
PRELIMINARY STEPS IN SHAPING HULL
TURN TO CORRECT DIAMETER AT EACH STATION AFTER MARKING ON CYLINDRICAL BLOCK........

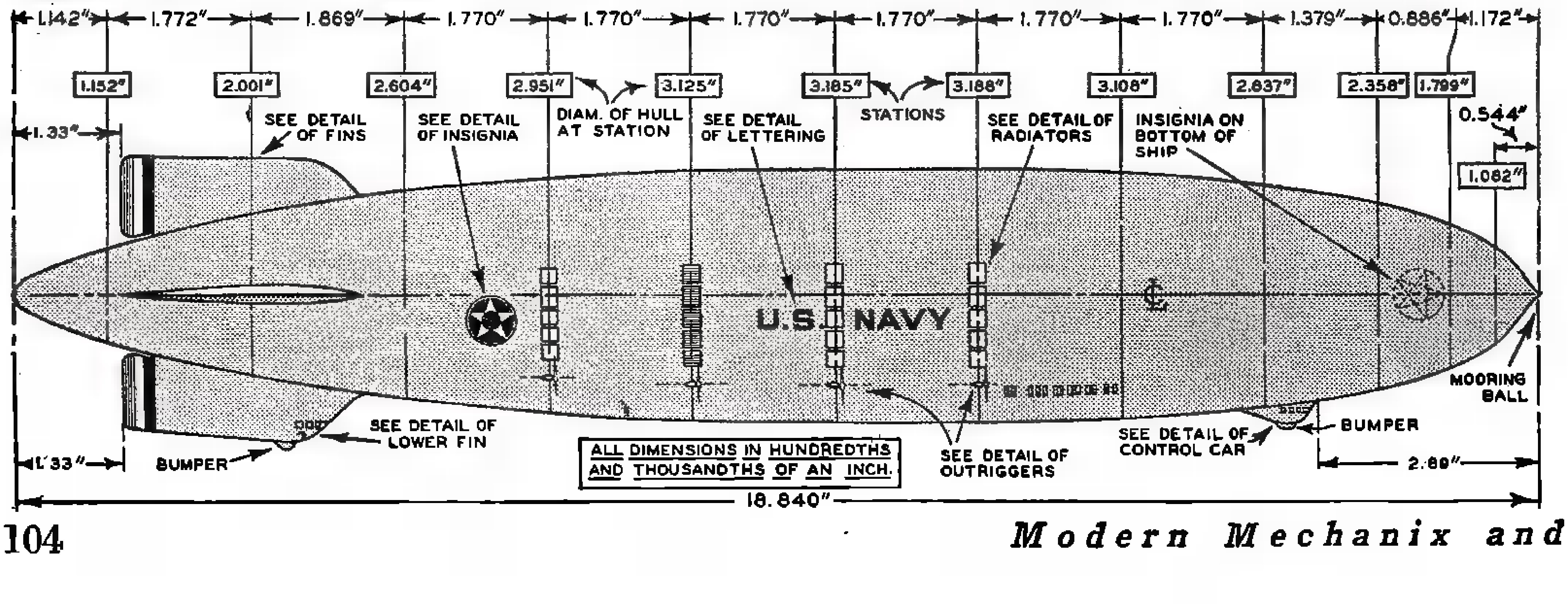
HERE they are—scaled plans for a dandy model of the pride of our Navy, the U.S.S. Macon. Eighteen inches long she'll be, with mooring mast, control cab 'n everything, and she'll look swell in her glistening coat of aluminum, sitting up there on the mantel.

The hull of the Macon is turned from a block of hard wood, first to its largest diameter of 3.188", and then down to the correct diameter at each station, as shown on the drawings. All dimensions are given in decimal fractions of an inch, to facilitate the scale reduction. A 6" steel scale graduated in hundredths of an inch should be used in laying out the hull.

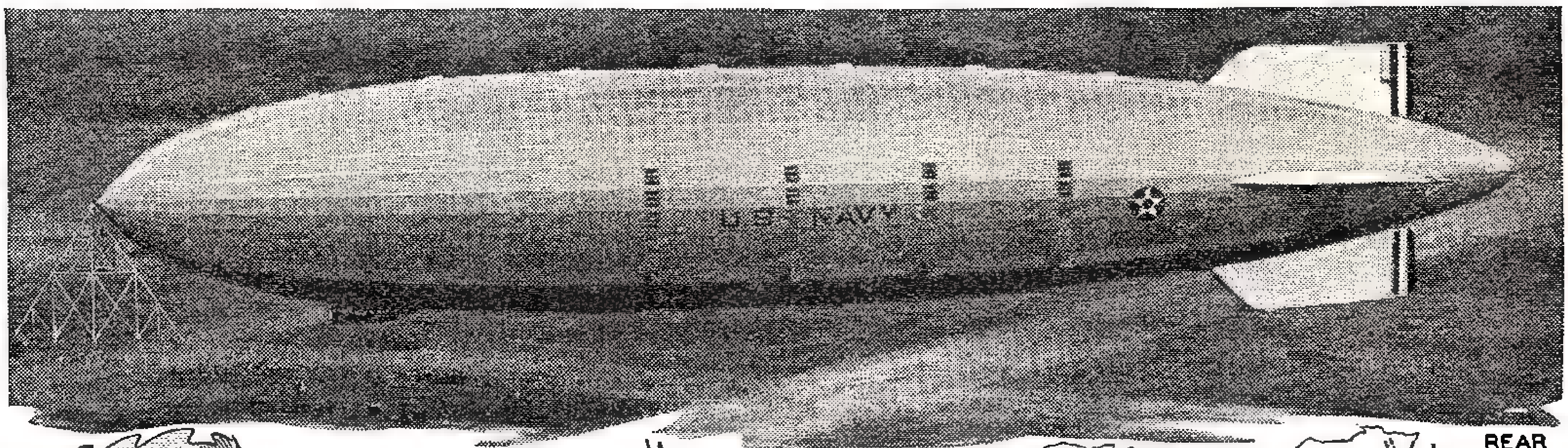
All fins are carved from wood to the

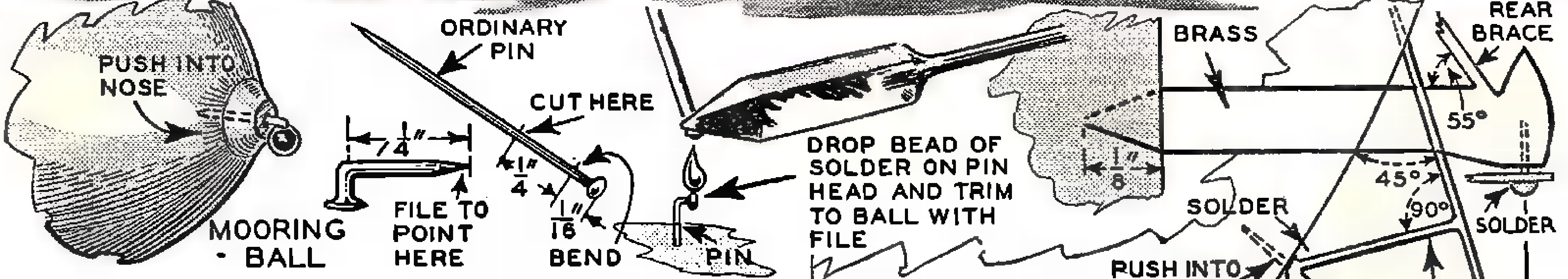

1.165"
0.388"
0.291"
0.292"
A
B
C
PAINT BLUE-WHITE
0.304"
RECESS WITH KNIFE
0.44"
0.169
0.01
DETAIL OF CONTROL CAR
0.308"
RECESS WINDOWS
SECTION A-A
0.356"
FILE TO CURVE OF HULL
0.20"
0.377"
SECTION B-B
0.321"
0.24"
SECTION C-C

Control cab is carved from a block of wood ½"x¼"x1¼". Section B-B shows how the bumper is formed below the cab. Windows are recessed by using knife and small chisel.


1.142"
1.772"
1.869"
1.770"
1.770"
1.770"
1.770"
1.770"
1.770"
1.379"
0.886"
1.172"
1.152"
2.001"
2.604"
2.951"
3.125"
3.185"
3.188"
3.108"
2.837"
2.358"
1.799"
1.33"
SEE DETAIL OF FINS
SEE DETAIL OF INSIGNIA
DIAM. OF HULL AT STATION
SEE DETAIL OF LETTERING
STATIONS
SEE DETAIL OF RADIATORS
INSIGNIA ON BOTTOM OF SHIP
0.544"
1.062"
U.S. NAVY
MOORING BALL
BUMPER
SEE DETAIL OF CONTROL CAR
2.69"
SEE DETAIL OF OUTRIGGERS
ALL DIMENSIONS IN HUNDREDTHS AND THOUSANDTHS OF AN INCH.
SEE DETAIL OF LOWER FIN
BUMPER
1.33"
18.840"

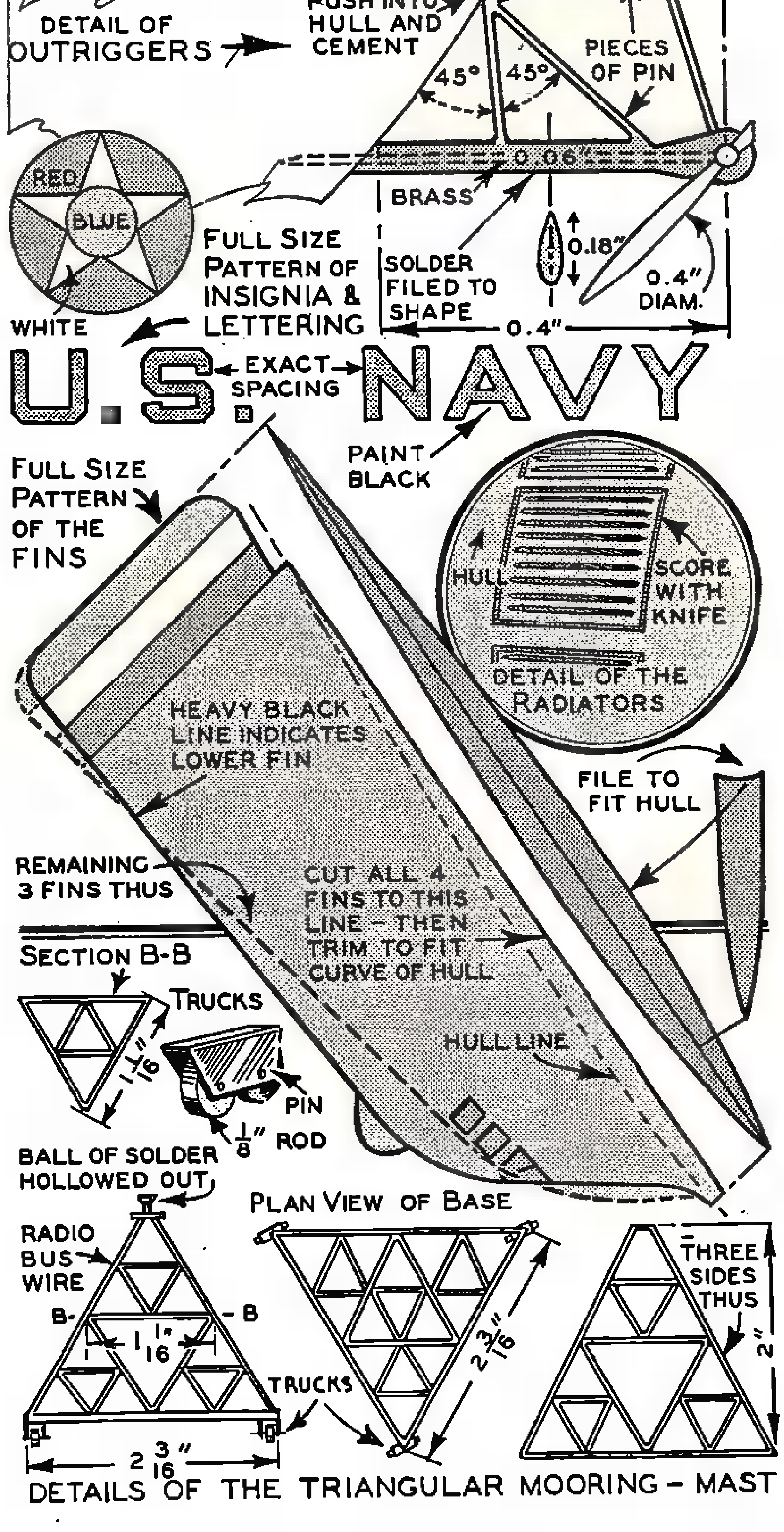
the Dirigible U. S. S. Macon




PUSH INTO NOSE
MOORING - BALL
ORDINARY PIN
CUT HERE
1/4"
1/4"
FILE TO POINT HERE
1/16" BEND
PIN
DROP BEAD OF SOLDER ON PIN HEAD AND TRIM TO BALL WITH FILE
BRASS
1/8"
REAR BRACE
55°
45°
90°
SOLDER
SOLDER

Details of the eight propeller outriggers. Solder is used to obtain streamlined effects for the struts. The full size pattern of the navy insignia and lettering gives the color scheme to be followed. Radiators are outlined in the hull by cutting notches with a knife.

Lower vertical fin is cut as indicated by heavy line in full size pattern at right; other three fins according to dotted lines. Mooring mast is of radio bus wire.


DETAIL OF OUTRIGGERS
PUSH INTO HULL AND CEMENT
45°
45°
PIECES OF PIN
0.06"
BRASS
BRASS
SOLDER FILED TO SHAPE
0.18"
0.4" DIAM.
0.4"
RED
BLUE
WHITE
FULL SIZE PATTERN OF INSIGNIA & LETTERING
U.S. NAVY
EXACT SPACING
PAINT BLACK
FULL SIZE PATTERN OF THE FINS
HULL
SCORE WITH KNIFE
DETAIL OF THE RADIATORS
HEAVY BLACK LINE INDICATES LOWER FIN
FILE TO FIT HULL
REMAINING 3 FINS THUS
CUT ALL 4 FINS TO THIS LINE - THEN TRIM TO FIT CURVE OF HULL
SECTION B-B
TRUCKS
1 1/16"
PIN
1/8" ROD
HULL LINE
BALL OF SOLDER HOLLOWED OUT
PLAN VIEW OF BASE
RADIO BUS WIRE
B-
-B
1 1/16"
TRUCKS
2 3/16"
2 3/16"
THREE SIDES THUS
2"
DETAILS OF THE TRIANGULAR MOORING - MAST

size of the full size pattern shown. The bottom vertical fin is different from the other three, in that it has a control car in its leading edge, and a bumper beneath to protect it when the ship is on the ground. Windows in its leading edge are cut into the fin with a knife and small chisel, and painted with white paint to which a small amount of blue has been added to give the bluish tint of glass. Hollow out slightly the edges to be glued to the hull, then glue them in place, using small brads if necessary.

The control car is carved from wood to the dimensions shown, windows are cut in and painted, and it is glued in place.

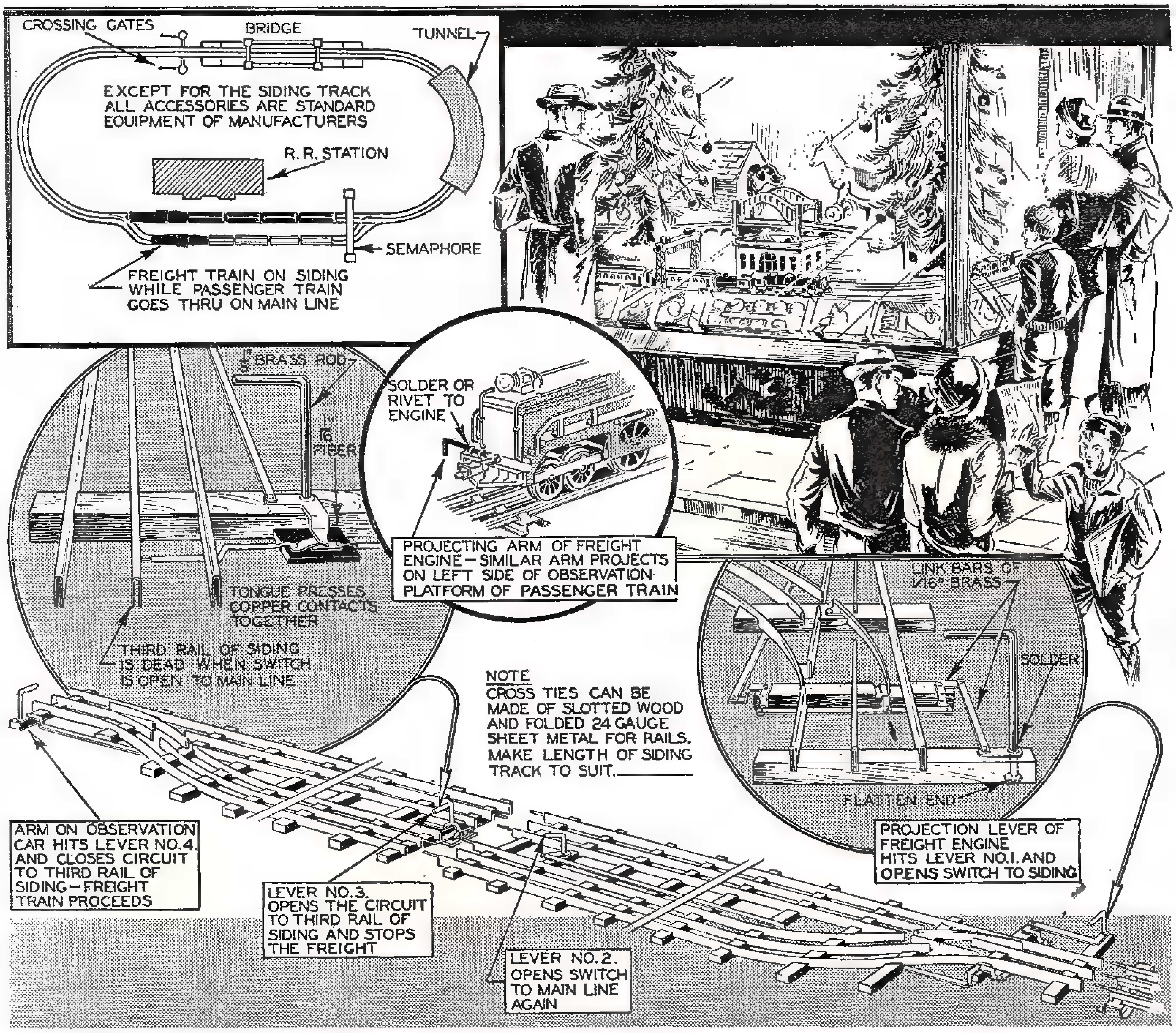
Since the Macon's eight Maybach engines are mounted inside the hull, only the outriggers on the eight propellers need be made. Drive shafts from each engine lead to swiveling balls containing bevel gears to which the propellers are attached.

The streamlined drive shaft housing can be formed from light brass or copper sheet cut to the contour shown in the sketch. Solder is made to flow over both sides of the flat housing strip until the desired streamlined shape is obtained. A file can be used to trim the solder where necessary. The housing is made ⅛" longer than shown, the extra length being driven into a slot in the hull.

The braces which support each drive shaft are cut from sections of small common pins, driving the pointed end into the hull and soldering the other end to the shaft housing.

(Continued on page 118)

Self-Switching Sidetracks for Electric Trains


CROSSING GATES
BRIDGE
TUNNEL
EXCEPT FOR THE SIDING TRACK ALL ACCESSORIES ARE STANDARD EQUIPMENT OF MANUFACTURERS
R. R. STATION
SEMAPHORE
FREIGHT TRAIN ON SIDING WHILE PASSENGER TRAIN GOES THRU ON MAIN LINE
1/8" BRASS ROD
1/16" FIBER
SOLDER OR RIVET TO ENGINE
PROJECTING ARM OF FREIGHT ENGINE—SIMILAR ARM PROJECTS ON LEFT SIDE OF OBSERVATION PLATFORM OF PASSENGER TRAIN
TONGUE PRESSES COPPER CONTACTS TOGETHER
THIRD RAIL OF SIDING IS DEAD WHEN SWITCH IS OPEN TO MAIN LINE
LINK BARS OF 1/16" BRASS
SOLDER
FLATTEN END
NOTE
CROSS TIES CAN BE MADE OF SLOTTED WOOD AND FOLDED 24 GAUGE SHEET METAL FOR RAILS. MAKE LENGTH OF SIDING TRACK TO SUIT.
ARM ON OBSERVATION CAR HITS LEVER NO.4. AND CLOSES CIRCUIT TO THIRD RAIL OF SIDING—FREIGHT TRAIN PROCEEDS
LEVER NO.3. OPENS THE CIRCUIT TO THIRD RAIL OF SIDING AND STOPS THE FREIGHT
LEVER NO.2. OPENS SWITCH TO MAIN LINE AGAIN
PROJECTION LEVER OF FREIGHT ENGINE HITS LEVER NO.1. AND OPENS SWITCH TO SIDING

Left top view shows layout of track used with two trains, one is a freight and the other a passenger. By the construction of the switch system shown the freight train goes on the siding, shuts off its own current, opens the switch for the passenger train which goes through on main line. There is a control on last Pullman which starts up freight train to follow.

ELECTRIC trains with their oval tracks soon become boring. After you have watched them go around in one direction, about the only other pastime is to see them go around in another direction. But here's an ingenious automatic side track suggested by M-M's own Dick Cole, the daddy of how-to-build writers. This Cole side track allows you to run two trains on the same track, just like a big railroad.

Freight and Passenger Trains

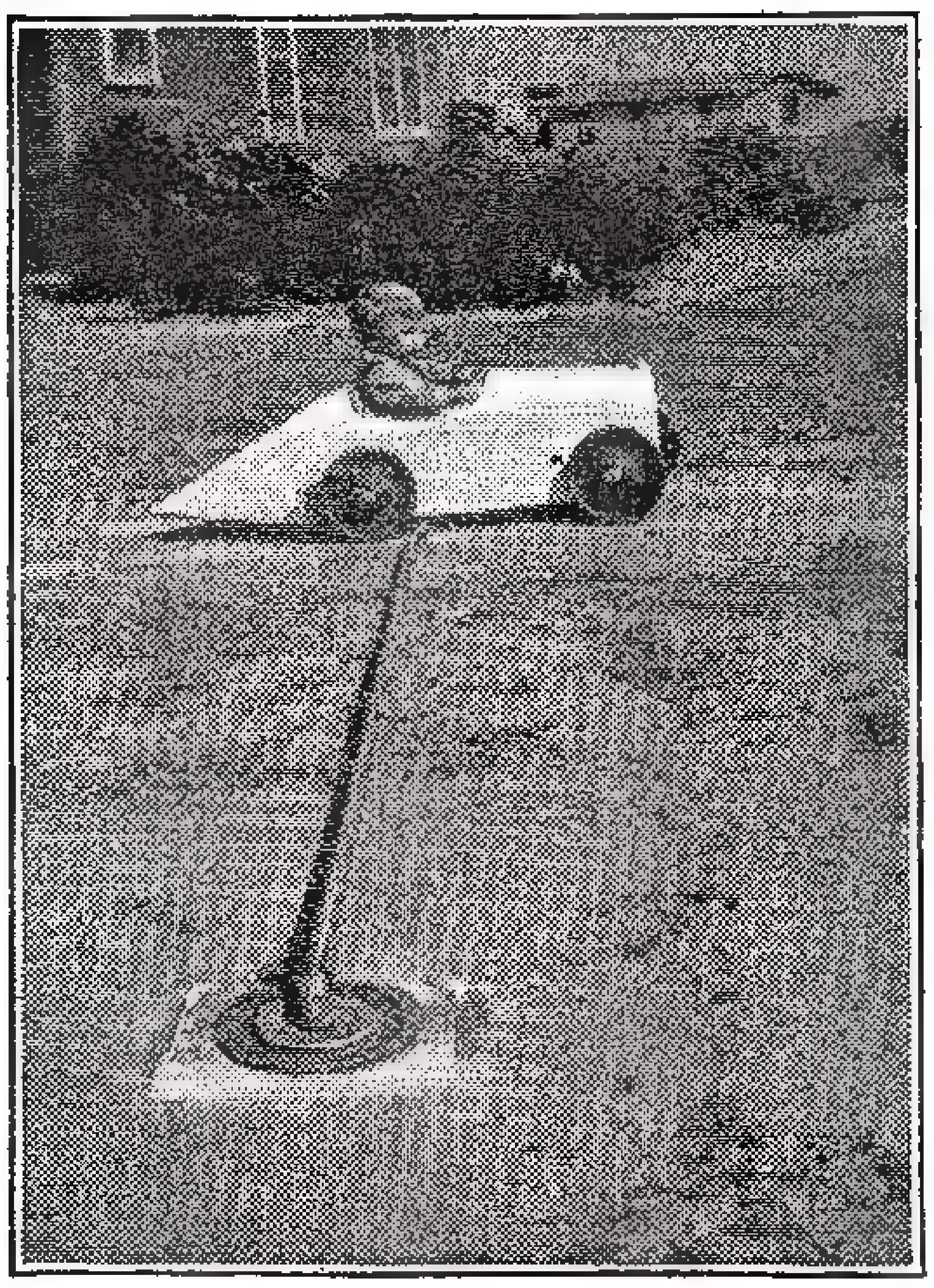
The siding can be built at home, too. Wooden ties and 24-gauge rails home made will do the thing nicely. A freight train goes on the siding ahead of a passenger train, which is following it around the track. The freight turns off its own current, closes the switch and opens the main line track. The passenger comes through the main line while the freight is dead on the siding. On the last Pullman there is a control which opens the side track switch and turns on the juice for the freight. The freight follows the passenger out and the two trains make the circuit. This time the passenger is shunted, and the process is kept up automatically.

How to Do It

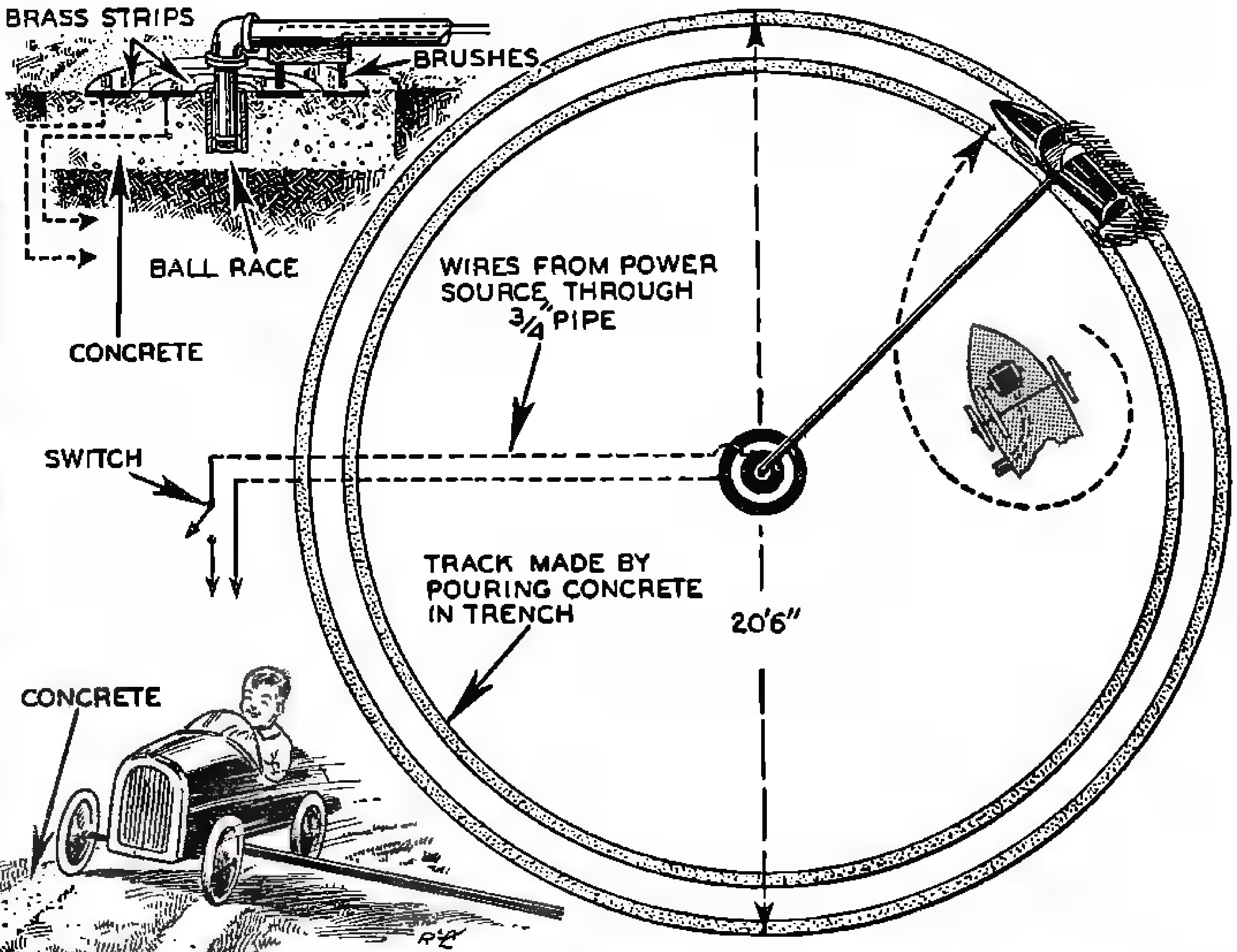
With very little alteration the standard switches supplied by the makers of the trains can be re-designed to suit the purpose. Or the ingenious man or boy can make switches and siding by using ½x½-inch ties and folded 24-gauge galvanized iron rails. The circuits and the method of making the track and switchpoints is shown in the drawings at the top of the page. The link bars are of 1/16 inch brass. A spacing of about two inches would be about right for the ties. Some copper of half hard variety would do for the contacts of the switches.

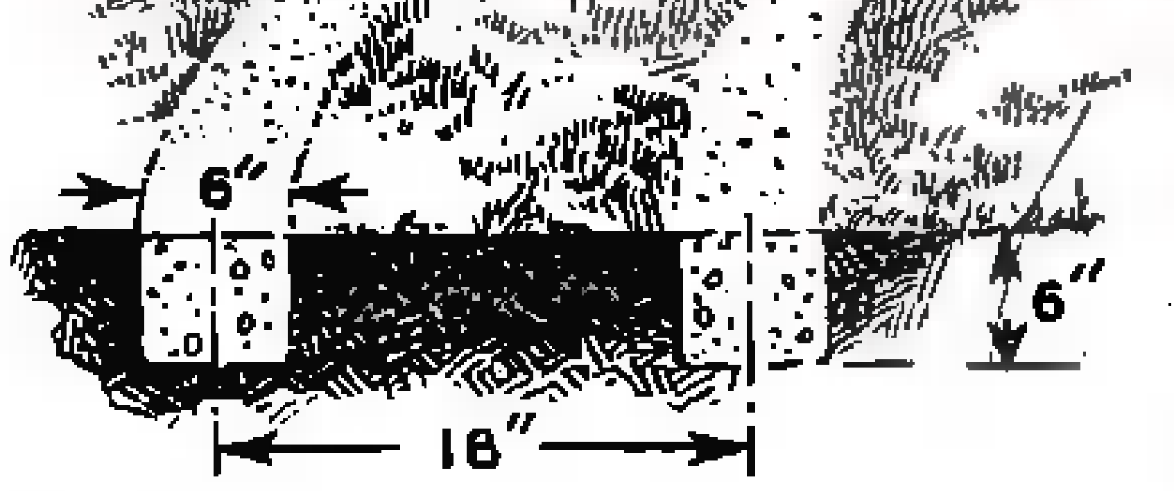
Possibly some smart merchant will appropriate this idea. It is a natural for window displays!

Tiny Electric Car Runs 12 m. p. h. on Track



This tiny electric car driven by an ordinary 110-volt a.c. motor spins around its 20 ft. diameter concrete track at a speed of 12 m.p.h. Power wires run through the iron pipe.


BRASS STRIPS
BRUSHES
BALL RACE
CONCRETE
WIRES FROM POWER SOURCE THROUGH 3/4" PIPE
SWITCH
TRACK MADE BY POURING CONCRETE IN TRENCH
20'6"
CONCRETE



THIS tiny electric car constructed by Woodrow McCrate of Black, Texas, spins merrily around on its 65 foot concrete race track at speeds of up to twelve miles per hour. It has made a decided hit with the little tots of this Texas town.

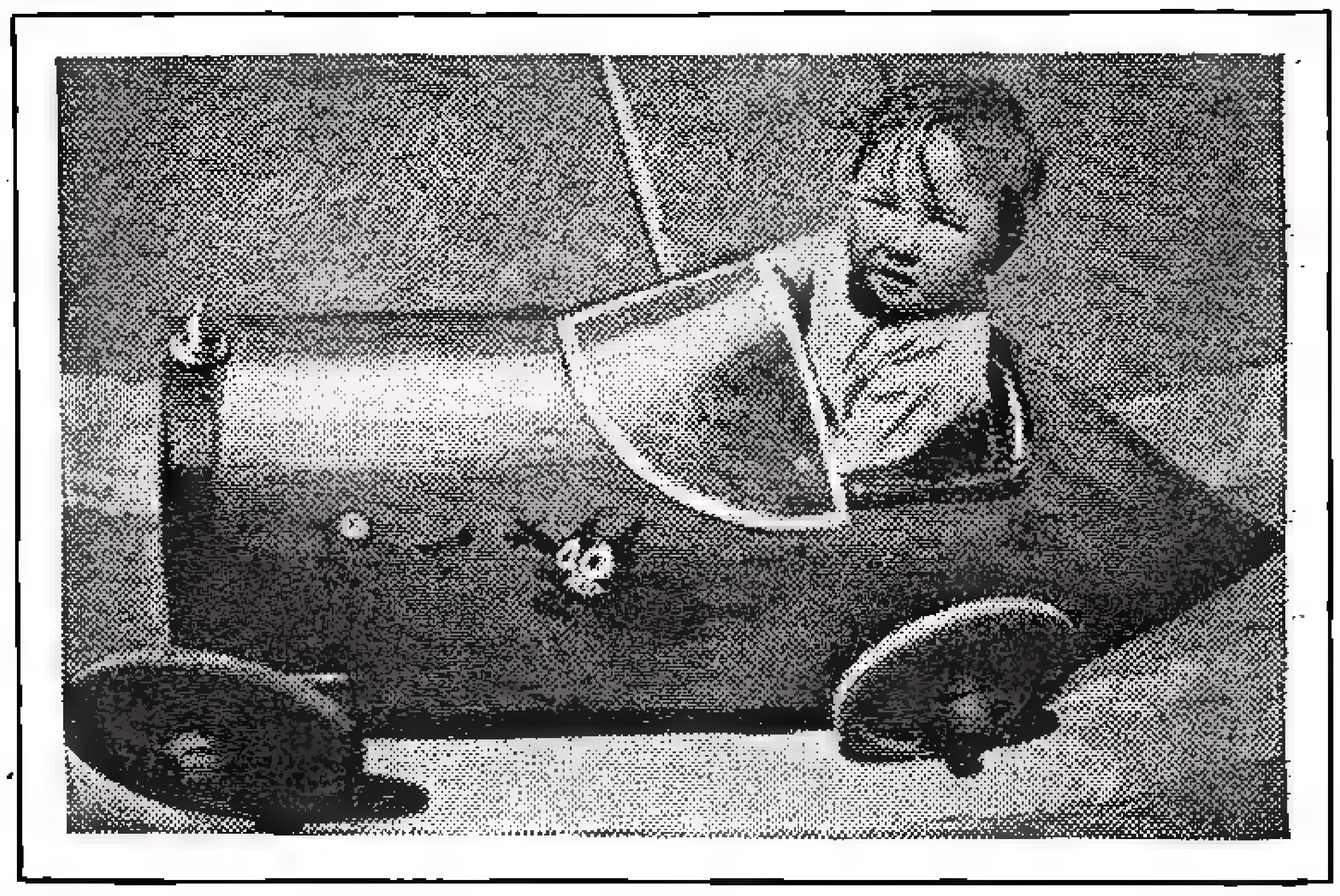
Power from the regular house lighting circuit is used to run the car. An ordinary ¼ h.p., 110 volt a.c. motor is mounted in the rear of the toy automobile, and connected to the rear axle through speed-reducing gears.

An iron pipe pivoted about the center of the track keeps the car running on its circular course, and also serves as a means for bringing the electric power wires to the car. Brushes mounted on a piece of wood fastened to the pipe make contact with two circular brass strips, springs being used to keep the brushes in contact with the stationary rings. The brass strips are mounted on a wood block which is in turn set in concrete. Power wires are run underground in a ¾" pipe from the power source to the brush rings.

The tracks on which the car runs are made of concrete, and are 6" wide by 6" thick. The two circular tracks of concrete are 18" apart center to center, and 20' 6" in diameter.

The track was made by pouring cement in a trench of the correct size, the finished track being level with the surrounding ground.

Although this car was made for a two year old child, it will easily pull children up to five years of age at speeds of up to 12 m.p.h. This is sufficiently fast for a circle of this size.

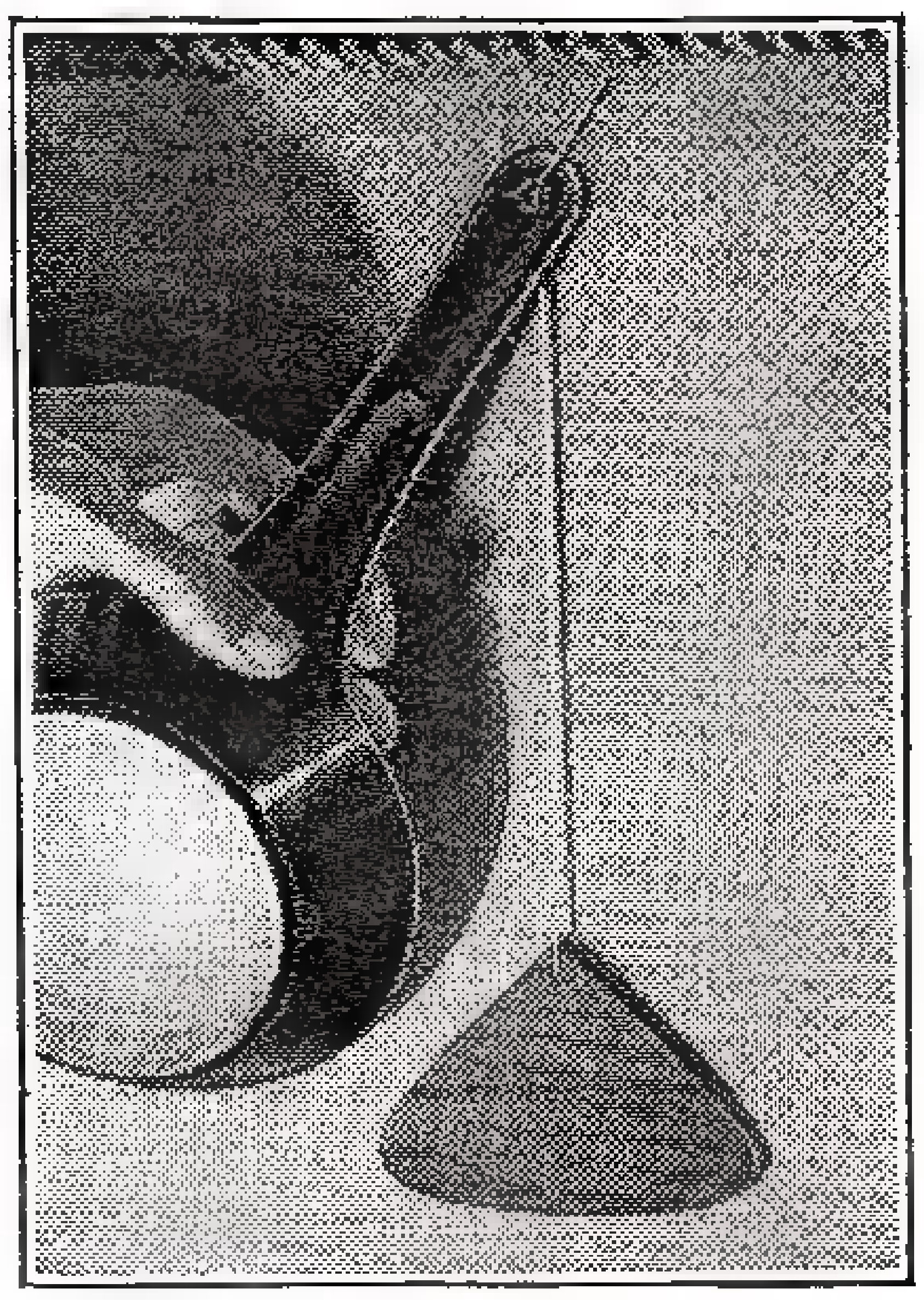


Above sketches show details of concrete race-track, and method of running house lighting current to ¼ h.p. motor in rear of car. Concrete tracks are level with ground. Below is a view of the electric car with its tiny driver.

Rubber Pad Keeps Pans From Wall

POTS, frying pans, and other cooking utensils which are hung from hooks often scar the walls and leave grease marks.

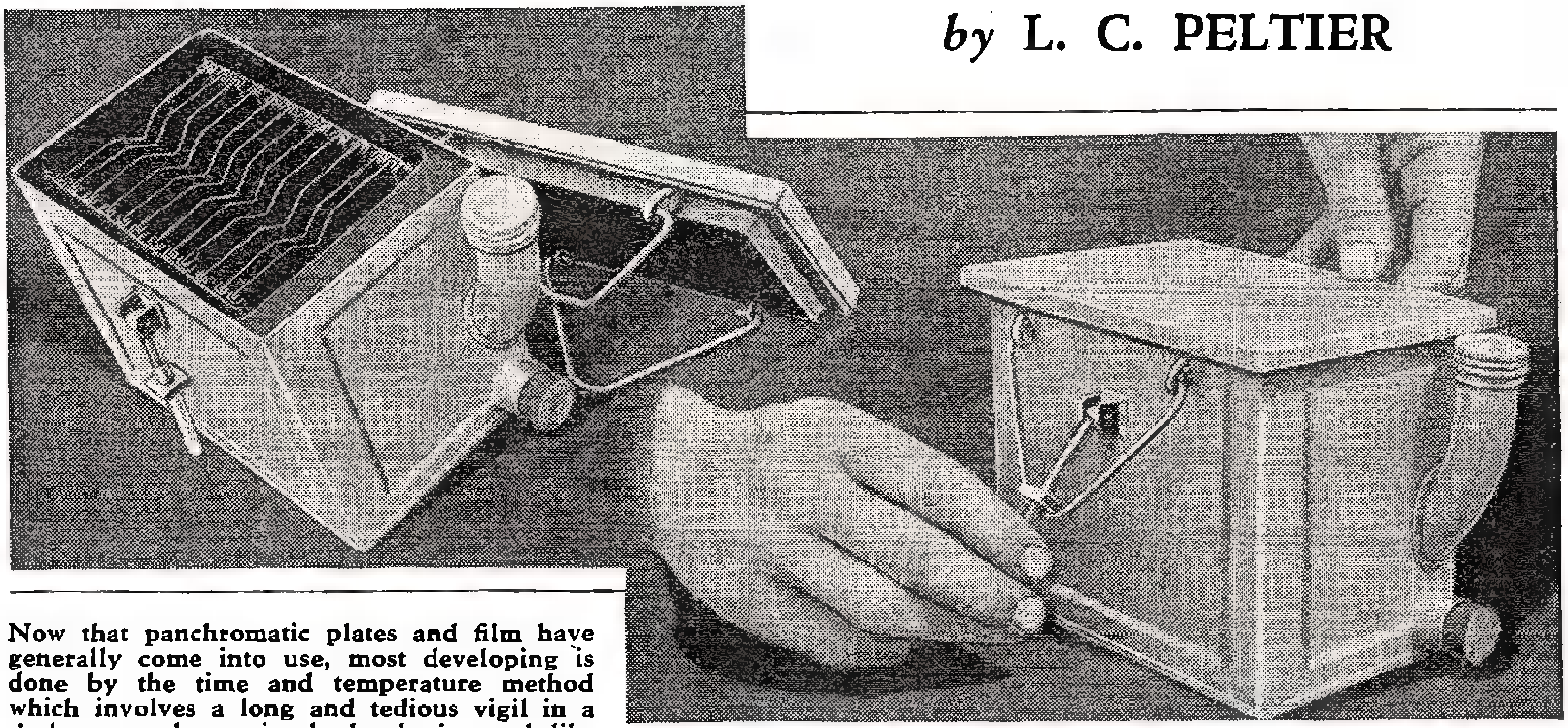
Rubber pads made from discarded inner tubes and hung from the hooks by strings will provide cushions for the pans. The pads may be cut into fancy shapes such as triangles, shamrocks, or hearts if desired.



Rubber pads hung from hooks by string keep kitchen utensils from scarring walls. Pad is adjusted to hang at point where the pan would touch the wall.

Daylight Developing Tank

by L. C. PELTIER



Now that panchromatic plates and film have generally come into use, most developing is done by the time and temperature method which involves a long and tedious vigil in a darkroom unless a simple developing tank like this one is used. Made from a varnish can, this developing tank will perform all functions in broad daylight if accompanying instructions are followed.

THE entire equipment necessary for developing, fixing and washing photographic negatives can be constructed from half of a one-gallon varnish can, together with a few other odds and ends of scrap material.

Since panchromatic plates and films have come into common use, developing is generally done by the "time and temperature" method. This is usually done in total darkness, using three or more trays or tanks containing separate solutions of developer, water and hypo. Obviously there are many disadvantages to this method but with the one-tank system to be described these may all be eliminated.

Tank Will Hold Twelve Films

A long tedious vigil in a stuffy dark room is no longer required. Instead, the plates or films are transferred from the plate-holders to the tank in a dark-room or changing bag, the cover placed on the tank, and the remaining operations may all be done in broad daylight.

The tank shown was designed to accommodate twelve cut films of size 3¼ by 4¼. For use with plates or films of other sizes some of the dimensions will, of course, have to be varied accordingly.

The average one-gallon varnish or paint can has a base measuring about 4 by 6 inches. The can should be sawed in two at a height of 5¼ in. which allows a 3/16" edge to be turned over on the inside. Most cans of this type have a raised bottom, 3/16" in this case, and solder should be run into the slight channel which this makes on the inside to provide a fairly smooth floor for the tank.

The inlet and outlet connections may be made from any light gauge tubing; in this instance they were sawed from an old pair of bicycle handlebars. Whatever is used should have an inside diameter large enough to permit the tank to be quickly filled and emptied. With a sharpened screwdriver and round file, holes are made in one corner of the tank and the connections inserted and soldered flush with the inner surface. An ordinary cork can be used to close the drain outlet but as the inlet pipe must be filled nearly to the top a screw-on cap should be used here and it will be found that the cap and neck cut from an old furniture polish can or similar receptacle can be easily soldered onto the inlet pipe, making a neat and well-fitting cap.

Solutions Circulate Freely

Some means must be provided which will permit the free circulation of the solutions and still prevent the passage of light. This is accomplished by a number of overlapping leaves or shutters of light gauge metal arranged as shown. The leaves are soldered to the tank and to the partition before the latter is put into place. Slant the leaves as shown to insure the complete drainage of the solutions. Cut the opening in the partition and solder into place.

Some form of protective coating must be applied to the inside of the tank to prevent the chemicals from attacking the bare metal. Special varnishes and enamels such as "probus enamel" and "traycote" are made for this purpose and sold by photo supply houses. They are inexpensive and easy to use as they may either be applied with a brush or flowed on. Ordinary asphalt may also be used although it is more difficult to apply properly as it must be heated before it will flow.

Whichever material is selected it will be necessary to coat the inside of the light-

Made from VARNISH Can

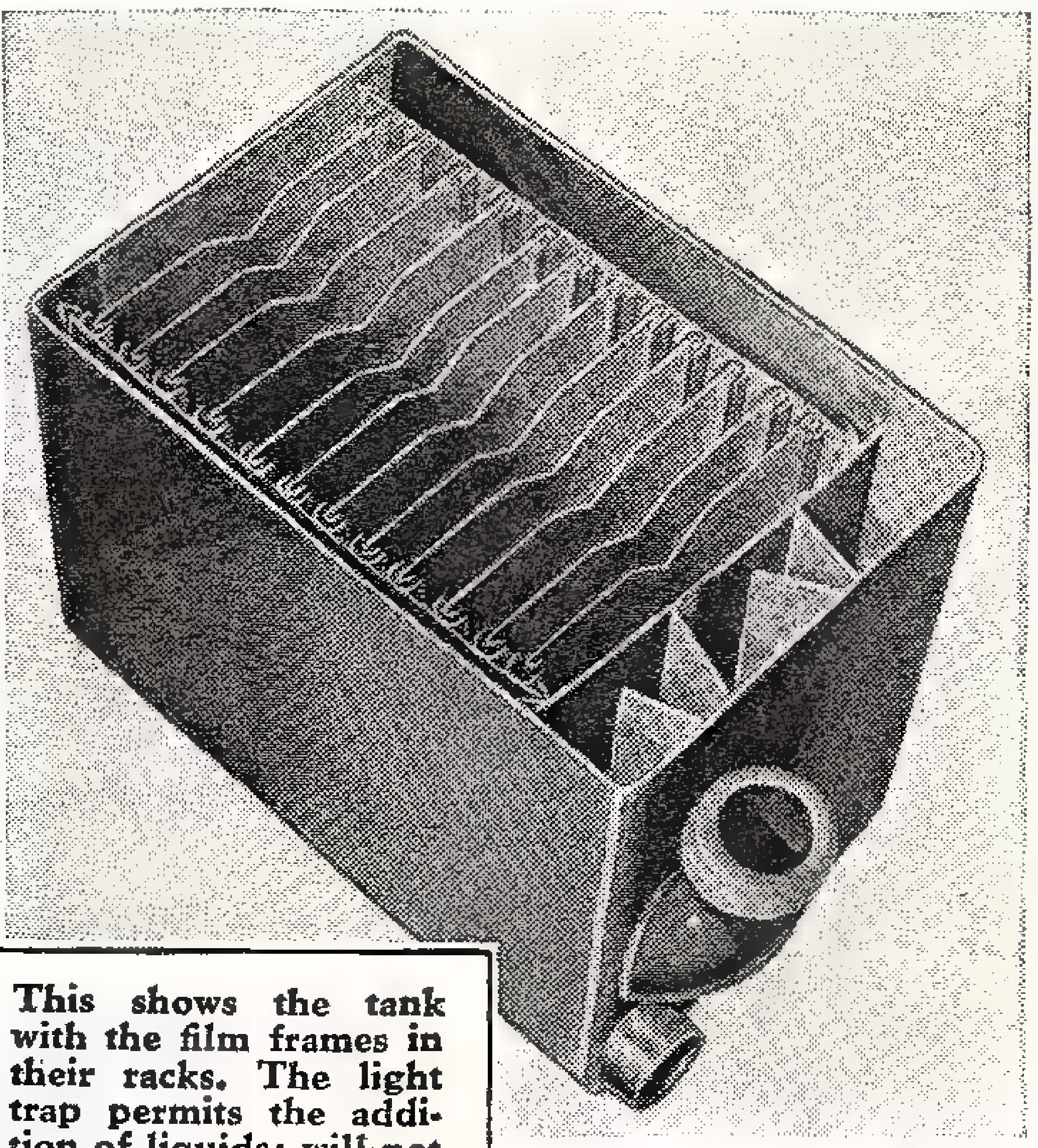
trap chamber before its cover is put on. If the asphalt is used heat it until quite hot and pour into the chamber. A gentle heat can be applied to the outside of the tank until the asphalt flows over and covers all surfaces with a fairly even coat. For any places which are hard to get at, an old table knife can be heated and used as a spreader. As asphalt dries with quite a gloss which might reflect some light through the chamber, it is well at this time to deaden this gloss by gently applying a little turpentine to the interior surfaces.

After coating the interior of the chamber, spread a thick coat on the inner surface of the chamber cover and solder this in place, then invert the tank and hold the soldering-iron in contact with the cover long enough to flow the asphalt which was placed upon its inner surface.

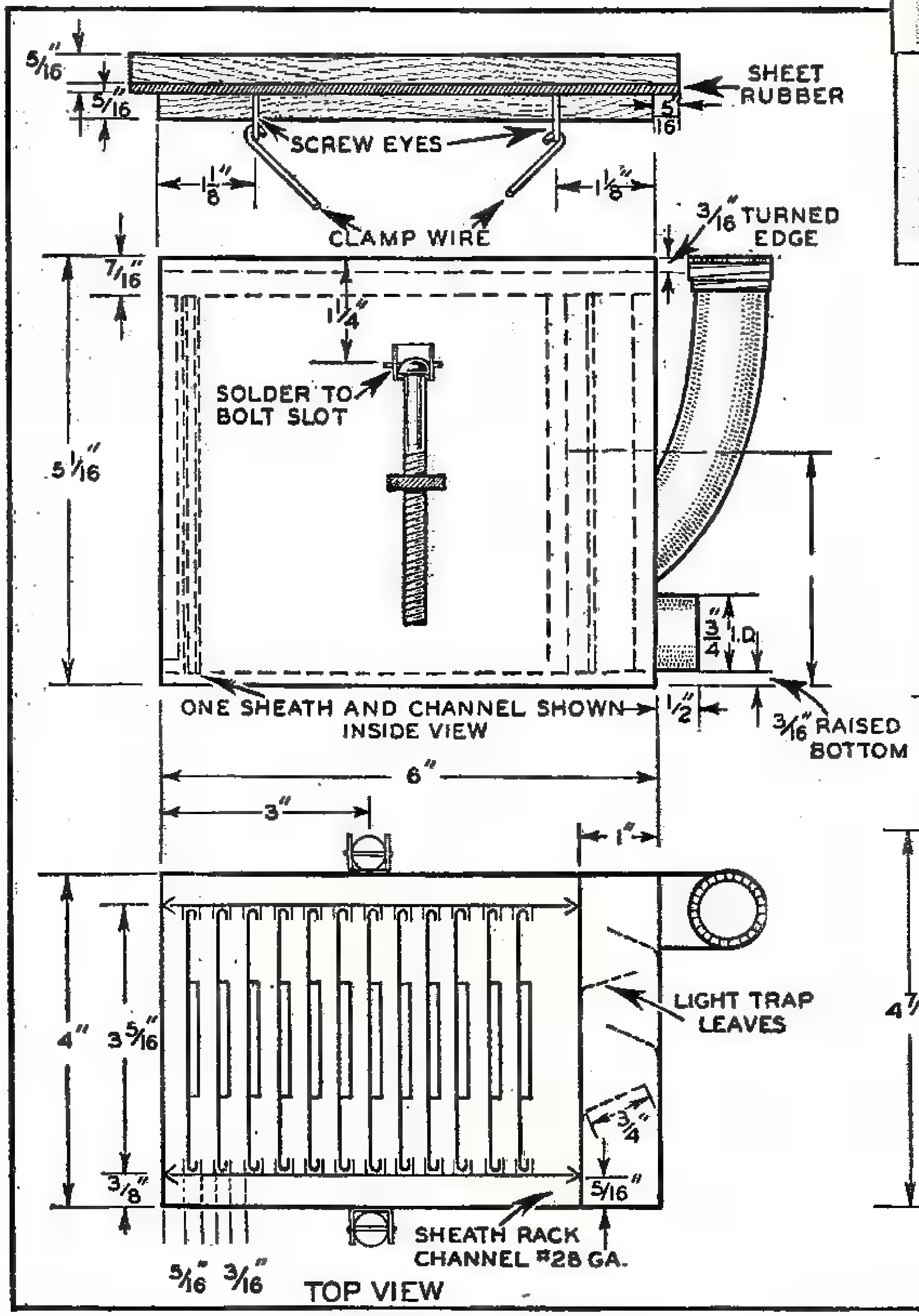
The sheath racks are simply flat pieces of sheet-metal to which are soldered the channels which support the negative sheaths. With a scribe mark out the locations for the channels. These latter are made by forming a 7/16" wide strip over the edge of a piece of 3/16" iron. After soldering these on, cut V-shaped notches in the base and drill a number of small holes between the channels to assist in the circulation and rapid drainage of the solutions. It will be found that by utilizing the spaces between the channels, an additional dozen negatives can be developed without over-crowding.

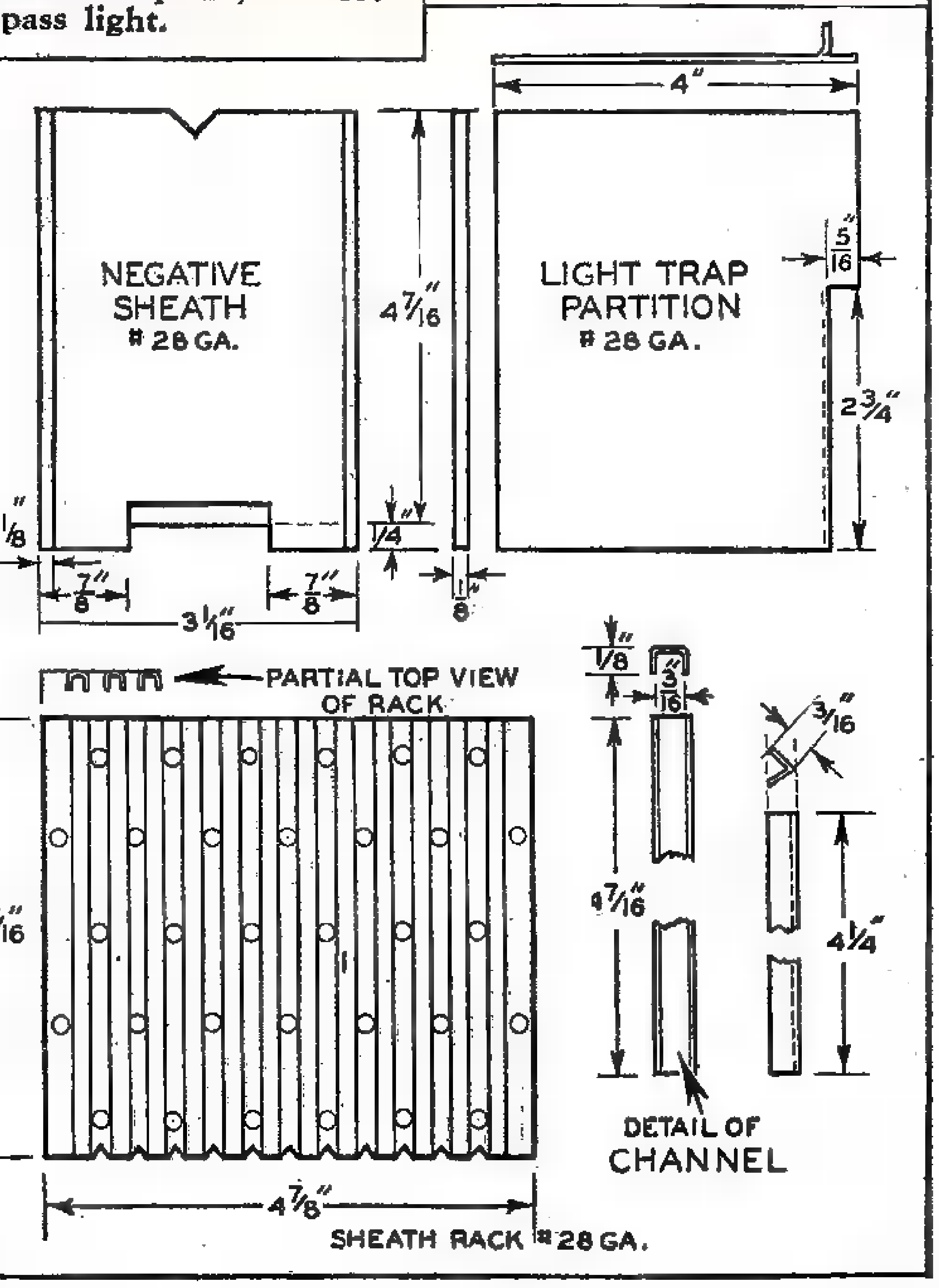
The most accurate way to make the negative sheaths is to lay an old negative on a piece of sheet metal with the top flush with one edge and with a scribe mark around the other three sides of the negative. Allow

(Continued on page 130)



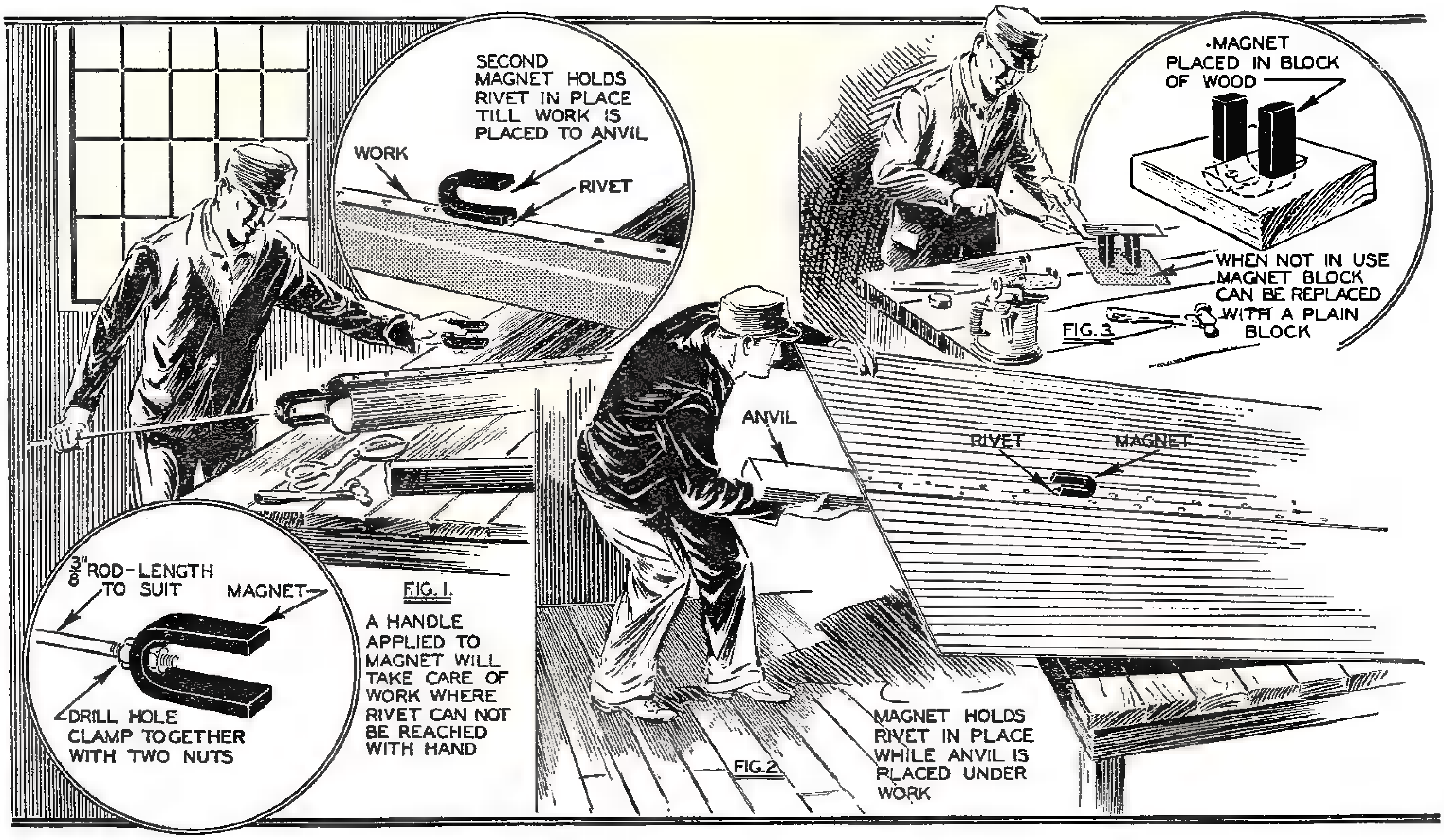
This shows the tank with the film frames in their racks. The light trap permits the addition of liquids; will not pass light.


5/16"
5/16
SHEET RUBBER
5/16
SCREW EYES
1 1/8"
1 1/8"
CLAMP WIRE
3/16" TURNED EDGE
7/16"
1 1/4"
SOLDER TO BOLT SLOT
5 1/16"
3/4 I.D.
ONE SHEATH AND CHANNEL SHOWN INSIDE VIEW
1/2"
3/16" RAISED BOTTOM
6"
3"
1"
LIGHT TRAP LEAVES
4"
3 5/16
3/4"
3/8"
5/16"
SHEATH RACK CHANNEL #28 GA.
5/16" 3/16"
TOP VIEW


NEGATIVE SHEATH #28 GA.
4 7/16
1/8"
7/8"
7/8"
3 1/16"
1/4
1/8"
4"
LIGHT TRAP PARTITION #28 GA.
5/16
2 3/4"
PARTIAL TOP VIEW OF RACK
4 7/16"
4 7/8"
SHEATH RACK #28 GA.
1/8"
3/16
4 7/16
3/16"
4 1/4"
DETAIL OF CHANNEL

The base size of the average varnish can is 4" by 6", which will allow of a tank being made to accommodate a dozen cut films 3 1/4 by 4 1/4 inches. All of the metal interior is simple sheet metal work, done with ordinary soldering iron.

Many Uses for Permanent Magnets in Sheet Metal Shop


SECOND MAGNET HOLDS RIVET IN PLACE TILL WORK IS PLACED TO ANVIL
WORK
RIVET
•MAGNET PLACED IN BLOCK OF WOOD
WHEN NOT IN USE MAGNET BLOCK CAN BE REPLACED WITH A PLAIN BLOCK
FIG. 3
ANVIL
RIVET
MAGNET
3/8" ROD-LENGTH TO SUIT
MAGNET
DRILL HOLE CLAMP TOGETHER WITH TWO NUTS
FIG. 1.
A HANDLE APPLIED TO MAGNET WILL TAKE CARE OF WORK WHERE RIVET CAN NOT BE REACHED WITH HAND
MAGNET HOLDS RIVET IN PLACE WHILE ANVIL IS PLACED UNDER WORK
FIG. 2

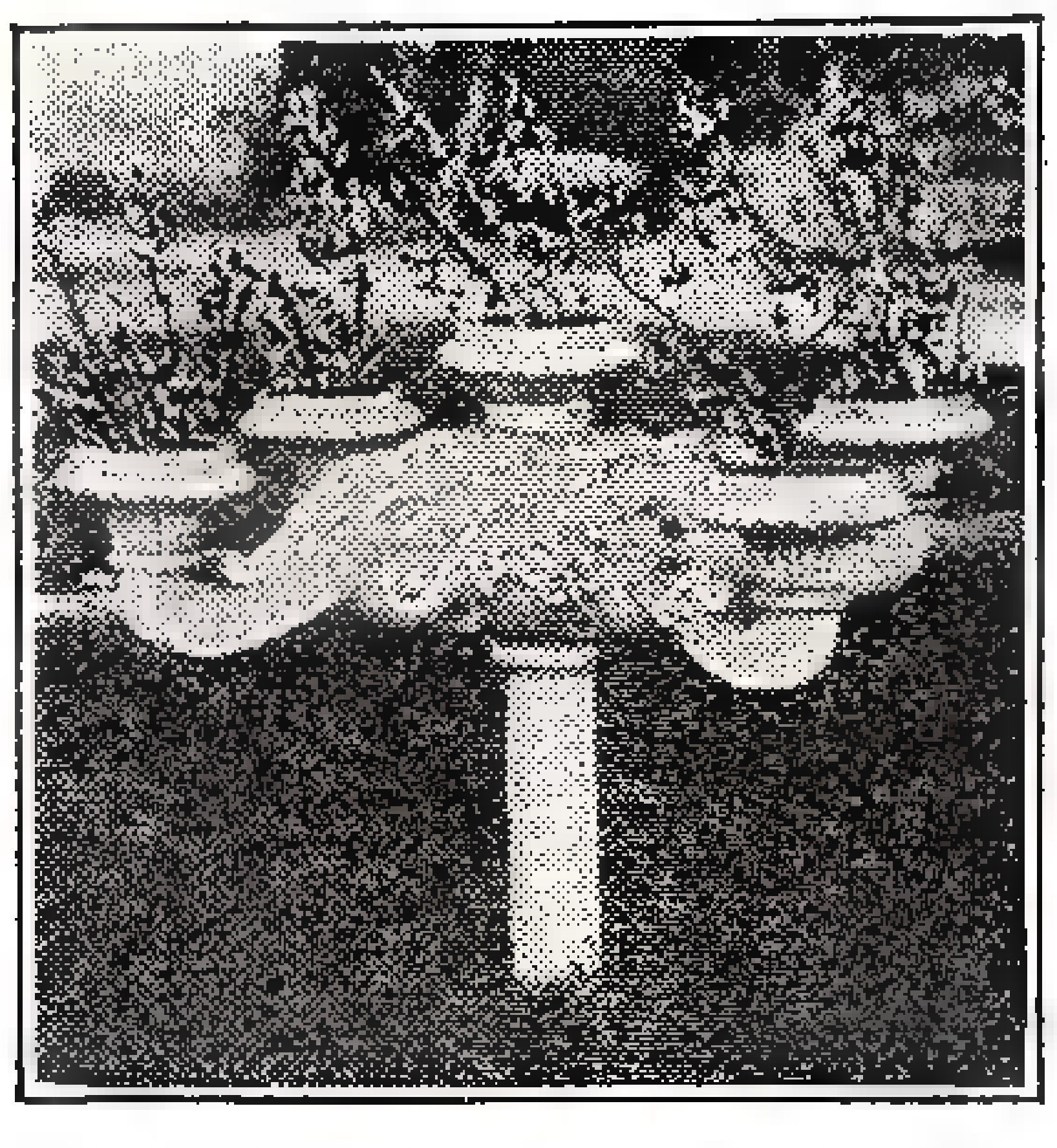
An iron rod bolted to a strong magnet, as shown above, makes a fine tool for placing and holding rivets inside long cylindrical work. A second magnet on the outside will hold the rivet in place until work can be placed on anvil. Magnet supported in block of wood makes handy vise for holding sheet metal being soldered without burning fingers.

HORSE-SHOE magnets such as can be obtained from old magnetos will prove handy to the home workshop fan as well as to the sheet metal worker. They can be used for holding light pieces of metal and for setting rivets and bolts in position in locations which are difficult to reach with the hand.

For setting rivets inside a long narrow cylindrical tube, drill a hole in the end of the magnet and bolt on a 3/8" iron rod to be used as a handle. A second magnet on the outside will hold the rivets in place until an anvil can be set in position. The same stunt can be used in riveting large flat pieces of metal.

A permanent magnet set into a fairly heavy block of wood makes a handy vise for holding small pieces of sheet metal for soldering or lining up a difficult layout.

Street Lamps Make Flower Pots

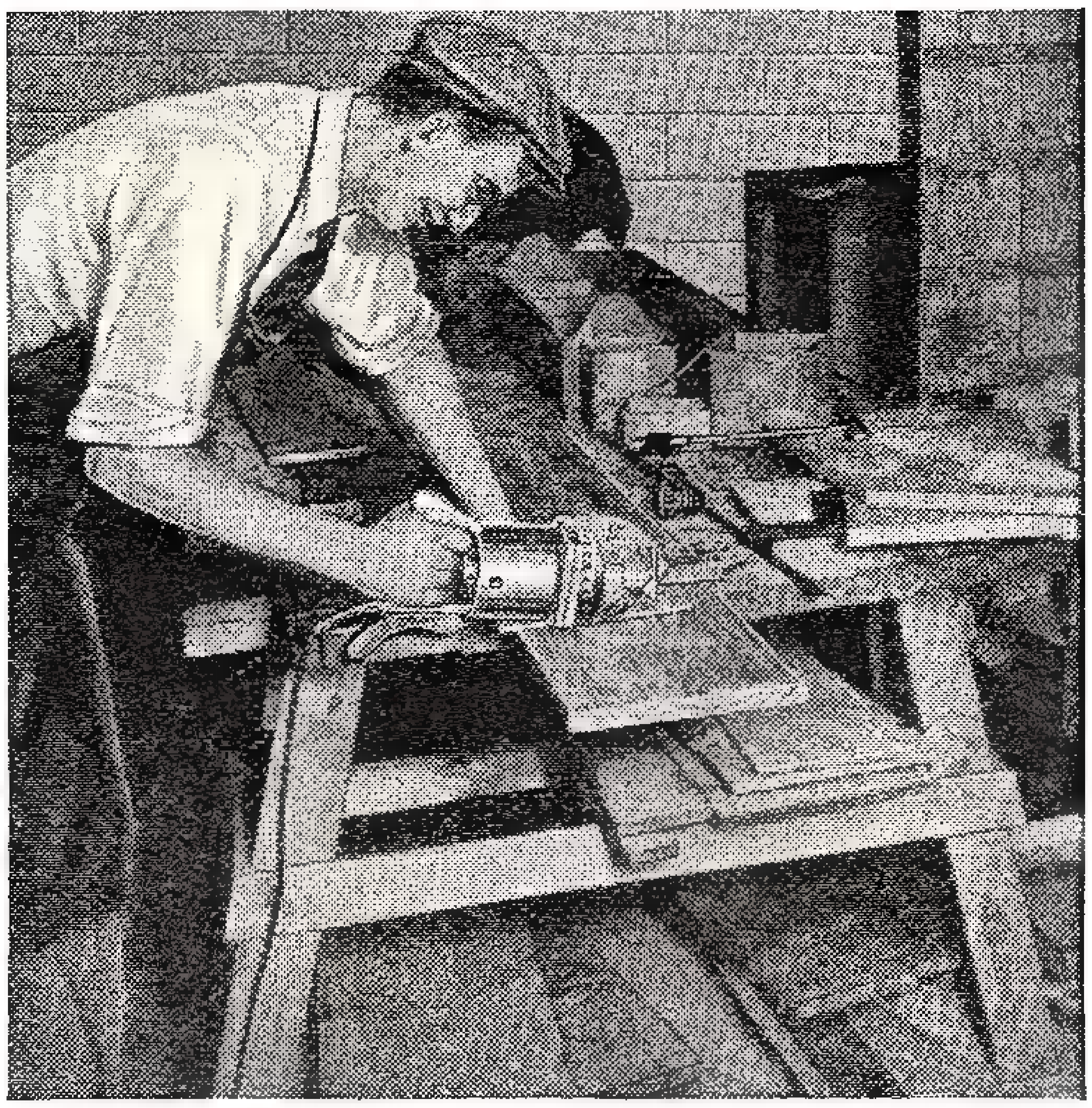


Flowers thrive in this cast iron flower bed. The top of an old street light was set in concrete.

THE tops of old decorative street lights make very attractive lawn decorations. The long standard is cut off, and the top part set in concrete on the lawn. Openings in the top are filled with black dirt, and flowers set in. Flowers thrive even better than in the ground.

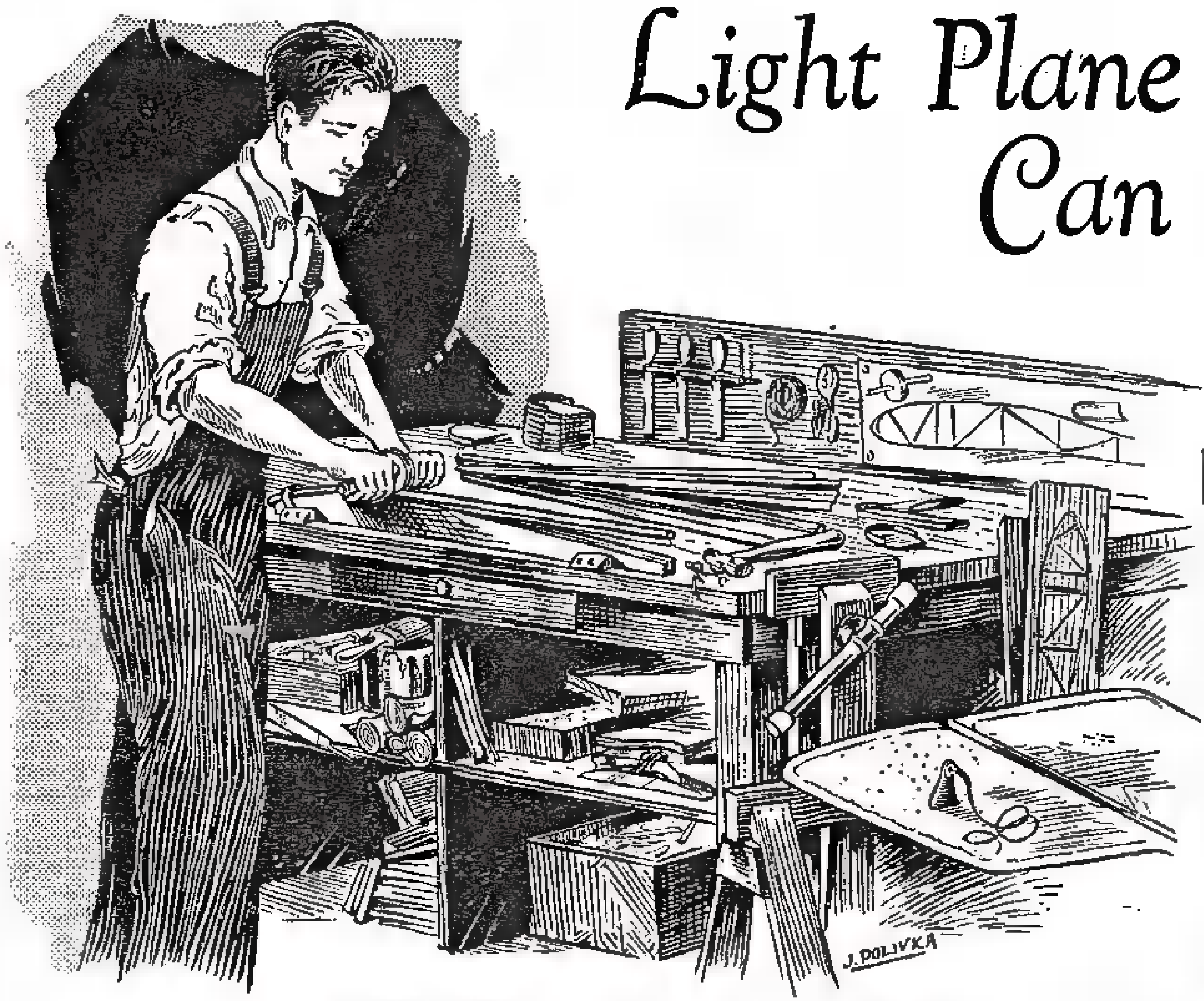
Small Power Saw Useful Tool

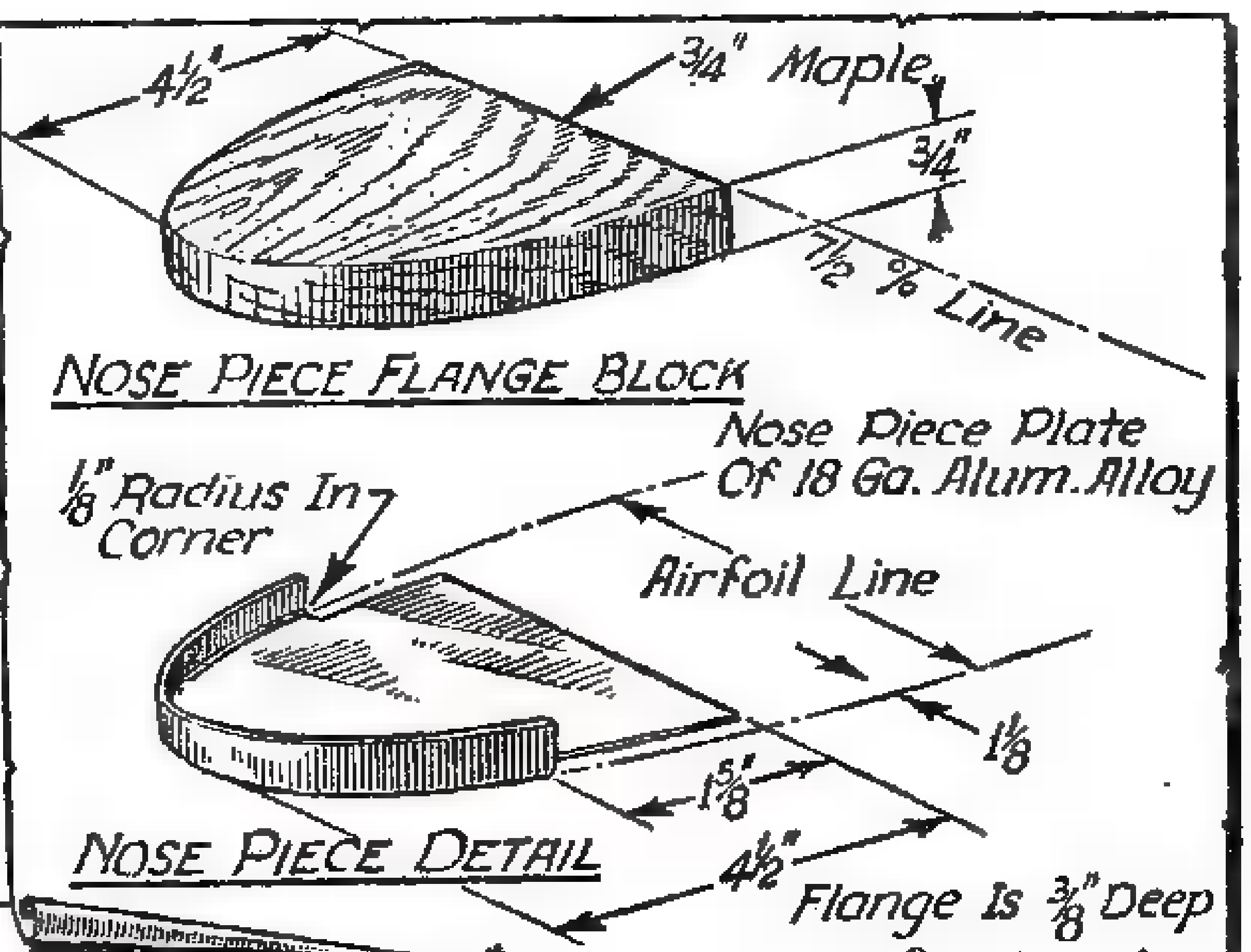
A VERY useful hand tool for carpenters and contractors and woodworkers of all callings is being manufactured by a Chicago tool company. This tool, running on 110 volts A.C., is a highly effective little circular saw which can be held in the hand for cross cutting, rip work, mitering, and other operations which require tedious hand labor otherwise. Although light in weight, the saw has plenty of power.



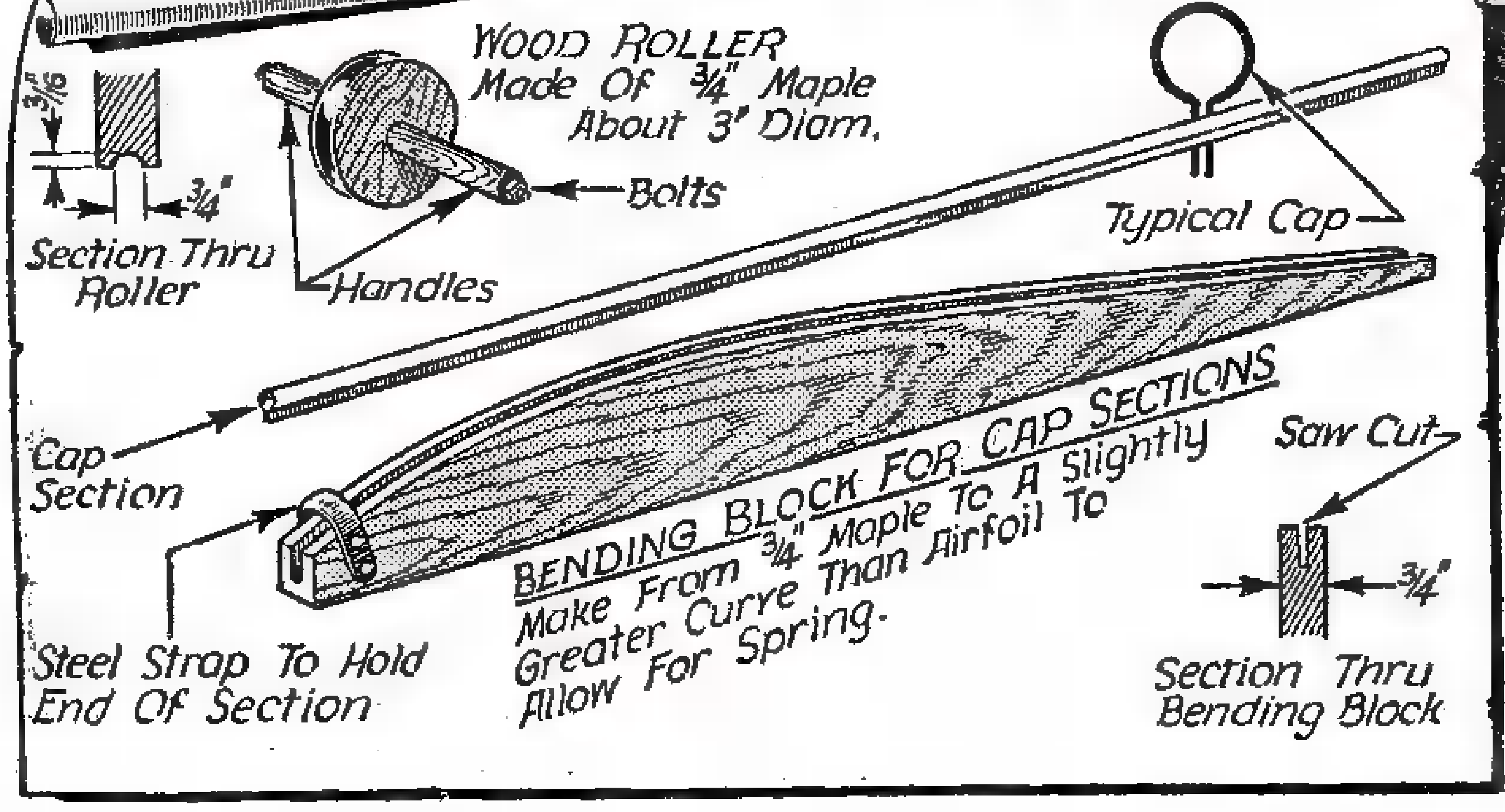
This portable electric saw has the accuracy of a bench power saw. It is ideal for the small wood-working shop.

Light Plane RIBS in Metal Can Be Built by Any AMATEUR




4½"
¾" Maple
¾"
½ % Line
NOSE PIECE FLANGE BLOCK
Nose Piece Plate Of 18 Ga. Alum. Alloy
⅛" Radius In Corner
Airfoil Line
1⅛
1⅝"
4½"
NOSE PIECE DETAIL
Flange Is ⅜" Deep

Metal ribs such as this are used in the Navy dive bombers, and will support 800 times their own weight. The nose flange is made by peening a sheet over a block of hardwood.


3/16
¾"
Section Thru Roller
WOOD ROLLER Made Of ¾" Maple About 3" Diam.
Bolts
Handles
Typical Cap
Cap Section
BENDING BLOCK FOR CAP SECTIONS Make From ¾" Maple To A Slightly Greater Curve Than Airfoil To Allow For Spring.
Saw Cut
Steel Strap To Hold End Of Section
¾"
Section Thru Bending Block

The Hall sections, obtainable from Aluminum Corp. of America, are formed in this rolling jig, which is bowed slightly more than the ordinates of the wing section being used to allow for spring.

by E. V. FAIRBANKS

MOST light plane builders and designers use a wooden rib for cheapness and ease of construction. For those seeking something new and who want the latest in airplane construction here's a metal rib.

This metal rib is not new in itself, being used on many of the latest military planes. The Navy dive bombers, a military sensation, use this type of rib exclusively. This type being the only one in continued use that stands the terrific strains imposed upon it, and yet is light. A rib of this construction has been built with a strength-weight ratio of 800. This means the rib will support 800 times its own weight.

The metal rib has many advantages over wooden ribs. Some of these advantages are:

1. No sharp edges exposed to the fabric or sewing. This is important as a sharp corner can easily cause the wing covering to rip and tear off during flight.
2. No waiting for the glue to dry while constructing the ribs, or wondering if the glued joint has enough area.
3. No smallest or minimum size as in wood. The smallest size that can hold the load may be used.
4. Any breaks are easily and quickly repaired by inserting a round wooden dowel in the broken part, and securing it in place with a rivet or pin. Diagonal or vertical members may be replaced by taking out the rivets or bolts attaching the part, which is simple to do.
5. The material used is all one size, and easy and quickly cut to size.
6. Strength and lightness as explained before.

The drawings show the rib construction and details for a light plane. The airfoil section used was similar to the NACA M-6. The beam locations and airfoil ordinates are given on the plans for the particular plane you have under construction.

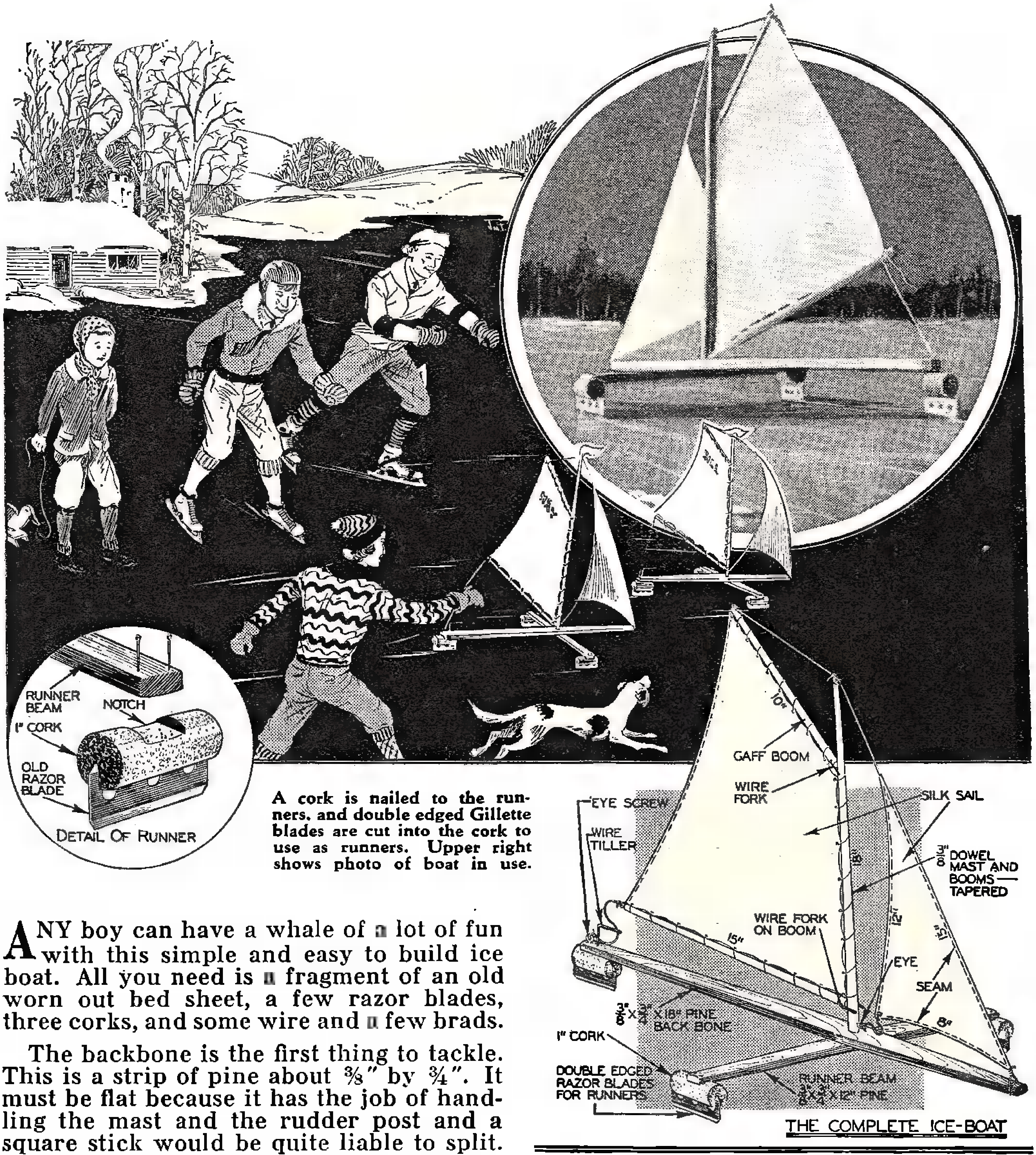
All the minor details of construction for this rib are not explained as most builders are familiar with riveting practice. If not, we suggest you read the article on building seaplane floats in the 1930 issue of "Flying Manual". Here is carefully explained how to rivet properly and successfully. The rivets to use are 1/16 diameter hard aluminum rivets, or, if you prefer, ¼" x No. 6-32 screws and nuts. The ribs are fastened to the beams by round head wood screws.

Shaping the Nose Piece

The nose piece is made by clamping the metal sheet between two nose blocks in a vise and hammering the flange over with a wooden mallet. Hammer around evenly, not bending it down completely at one place first. The shape of the nose piece flanging block is determined by the airfoil section. The metal sheet is cut by a template, made by adding ½" to the nose piece contour. The flange is evenly trimmed to ⅜" depth with tin snips after it has been

(Continued on page 118)

Speedy Model Ice Boat Built With Corks and Razor Blades


RUNNER BEAM
NOTCH
1" CORK
OLD RAZOR BLADE
DETAIL OF RUNNER
10"
GAFF BOOM
WIRE FORK
SILK SAIL
EYE SCREW
WIRE TILLER
3/8" DOWEL MAST AND BOOMS—TAPERED
18"
12"
15"
WIRE FORK ON BOOM
15"
EYE
SEAM
8"
3/8"X3/4"X18" PINE BACK BONE
1" CORK
DOUBLE EDGED RAZOR BLADES FOR RUNNERS
RUNNER BEAM 3/8"X3/4"X12" PINE
THE COMPLETE ICE-BOAT

A cork is nailed to the runners, and double edged Gillette blades are cut into the cork to use as runners. Upper right shows photo of boat in use.

The rigging of the model ice boat is conventional. A mild amount of slack is afforded in the jib and main sheet to let the sail belly; experience will dictate amount.

ANY boy can have a whale of a lot of fun with this simple and easy to build ice boat. All you need is a fragment of an old worn out bed sheet, a few razor blades, three corks, and some wire and a few brads.

The backbone is the first thing to tackle. This is a strip of pine about ⅜" by ¾". It must be flat because it has the job of handling the mast and the rudder post and a square stick would be quite liable to split. If you are of a mind to work in hardwood, and want your boat to be more or less of a permanent nature, use birch or maple for these wooden parts.

The cross beam is of the same material as the backbone, and if you want a real scale job, taper the cross beam from the center down to the ends where the runner crosses.

A couple of inch brads will serve to fasten the runner at right angles to the backbone, and if you want to do the thing right glue in a couple of dowels.

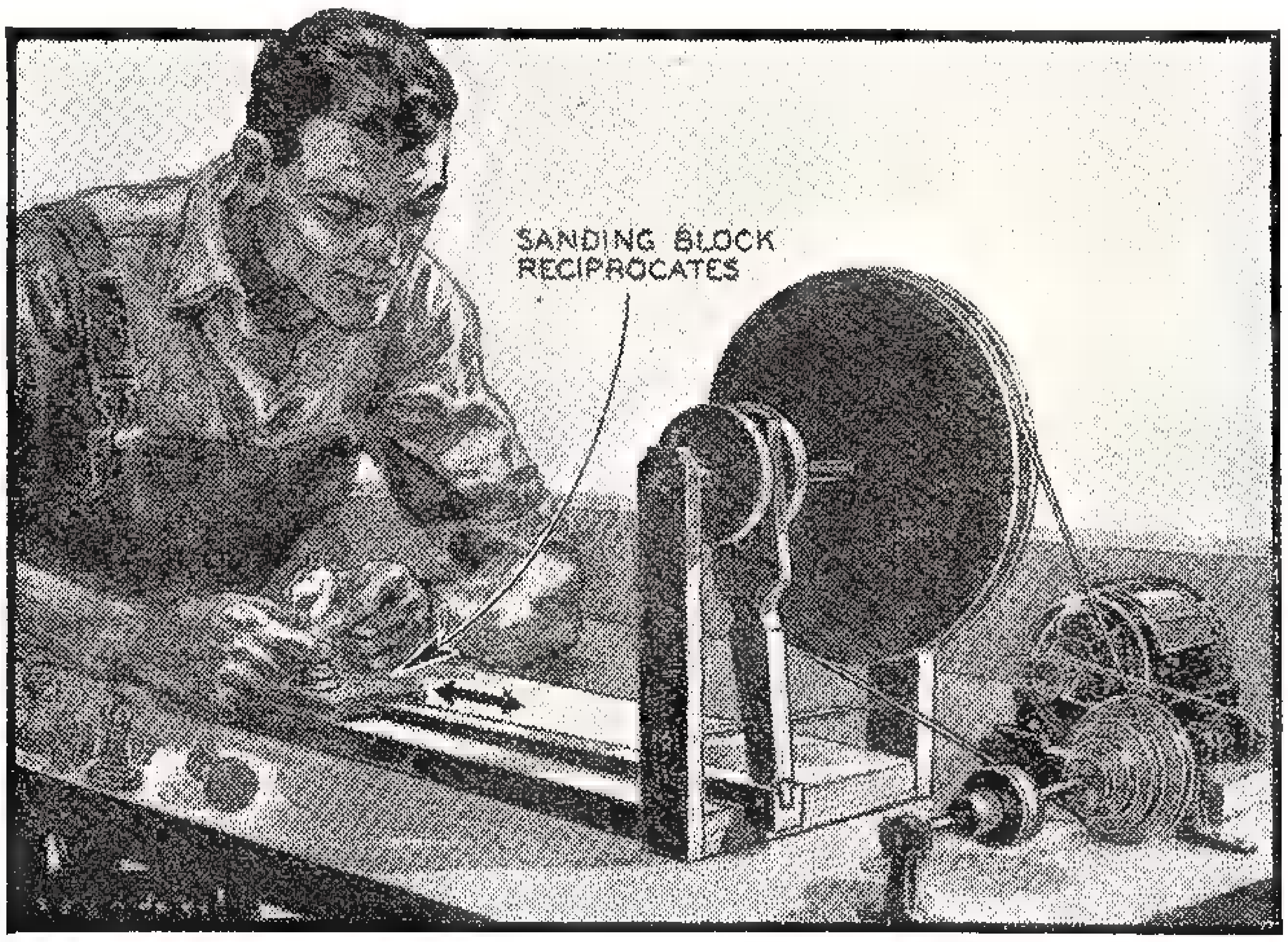
The mast dimensions are ⅜" by 18". It can be set in a snug fit hole in the cross beam. The cork docks for the runners are simple wine corks with parallel sides if you can get them, but drugstores handle all varieties of corks and you can get what you want at the corner.

The sails can be made out of sheeting, and should be hemmed and tightly sewed at the edges. Small grommets can be bought at local department stores in their model airplane supply departments if you are bent on making a real job of it. Fishline makes the best mast lashing.

The razor blades do not need to be sharp. Thus you can avoid cutting your hands by brushing a file along the edge. When built this little ship should go extremely fast. The model shown was a good sailer.

An ECCENTRIC SHOP SANDER

by DALE VAN HORN


SANDING BLOCK RECIPROCATES

This eccentric shop sander can be easily made, and serves many useful purposes which a drum or disc sander cannot. It will sand hard-to-get-at surfaces, and with an oil stone it makes a fine hone.

WE HAVE on the market today a pretty complete assortment of machines for the small home shop. Made substantially and for a reasonable price, the handy man can just about get what he wants and without pressing him financially.

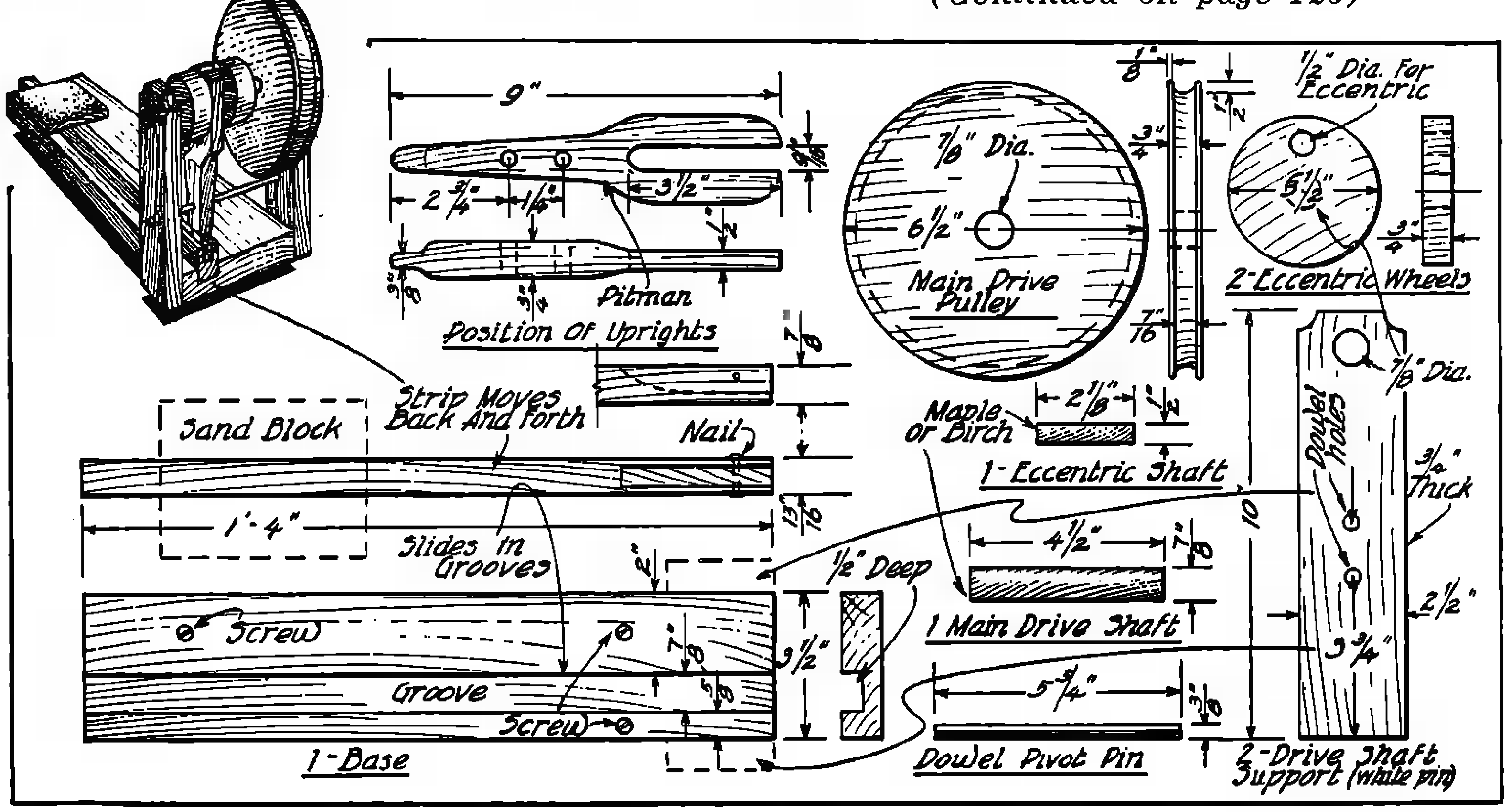
One of the things needed, and which should someday soon be available, is a small machine which will sand hard-to-get-at surfaces. This with the drum and disc sander will make one phase of home finishing complete. This sander will be of the oscillating type. The writer had completed the band sawing of some irregular pieces with sharp angles and found that doing the sanding of those portions of surface not possible on the drum or disc sander called for hand methods and so decided to make a machine to do the work instead, providing the design should not prove too hard to handle.

The mechanism needed was one which would move a small sandpaper block back and forth, face up, at high speed. Several small motors were available so it was logical that one of these be used for the power plant. To move back and forth the sandpaper block and support would have to be operated by a pitman mechanism probably from an eccentric built into a shaft turned by a grooved pulley. Moreover, there should be a reduction of speed because, if made of wood and not too elaborate, fittings could not be too close, and 1257 oscillations per minute, the R.P.M. of the motors, would doubtless wreck the machine in no time. Still this speed could be reduced 2 or even 4 times and there would still be a speed far greater than would be possible if the block were held in the hand.

A 1 inch square of birch, 5 inches long, is put between the lathe centers and turned down to ⅞ inch in diameter from end to end and sanded smooth.

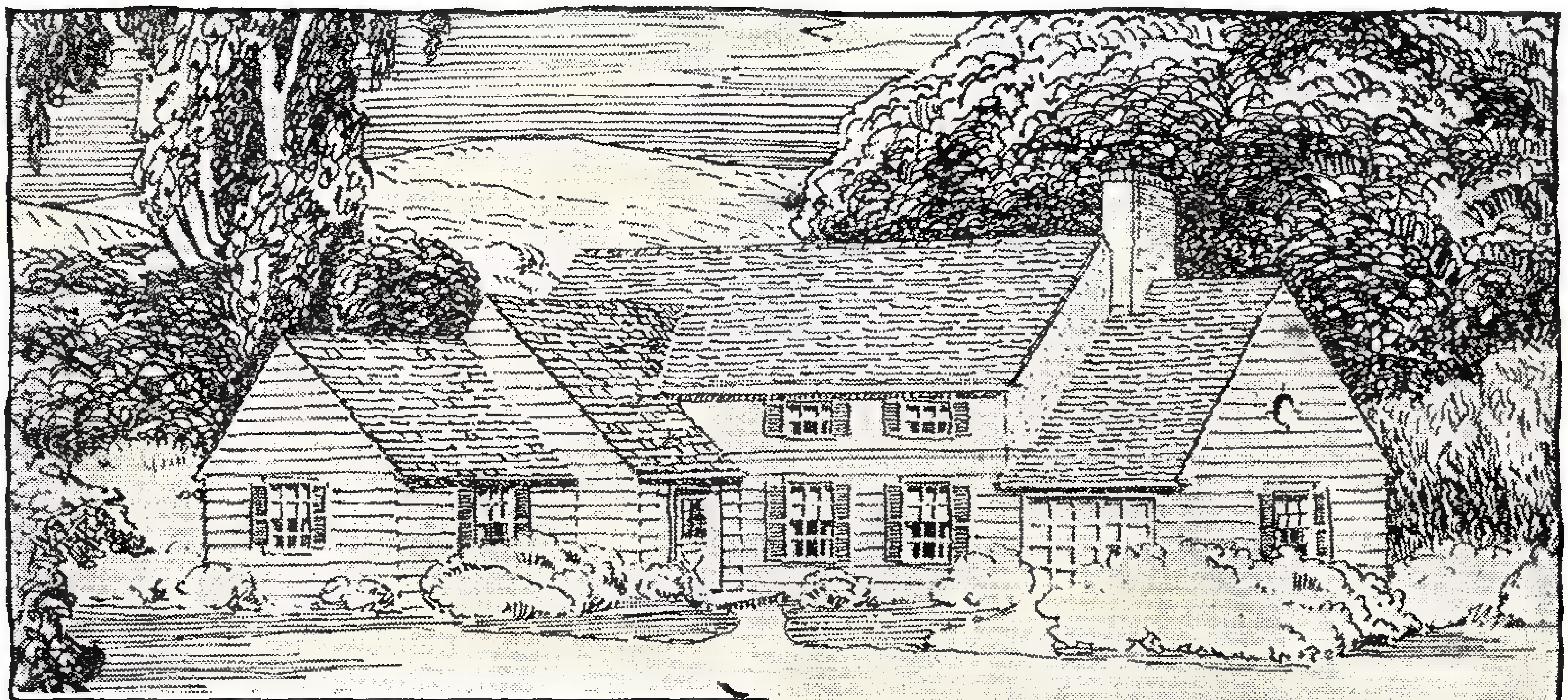
A block 6¾ inches square and ¾ inch thick is screwed to the lathe face plate and turned down to form the pulley 6½ inches in diameter with a groove 7/16 inch wide at the edge and about ½ inch deep. The

(Continued on page 126)

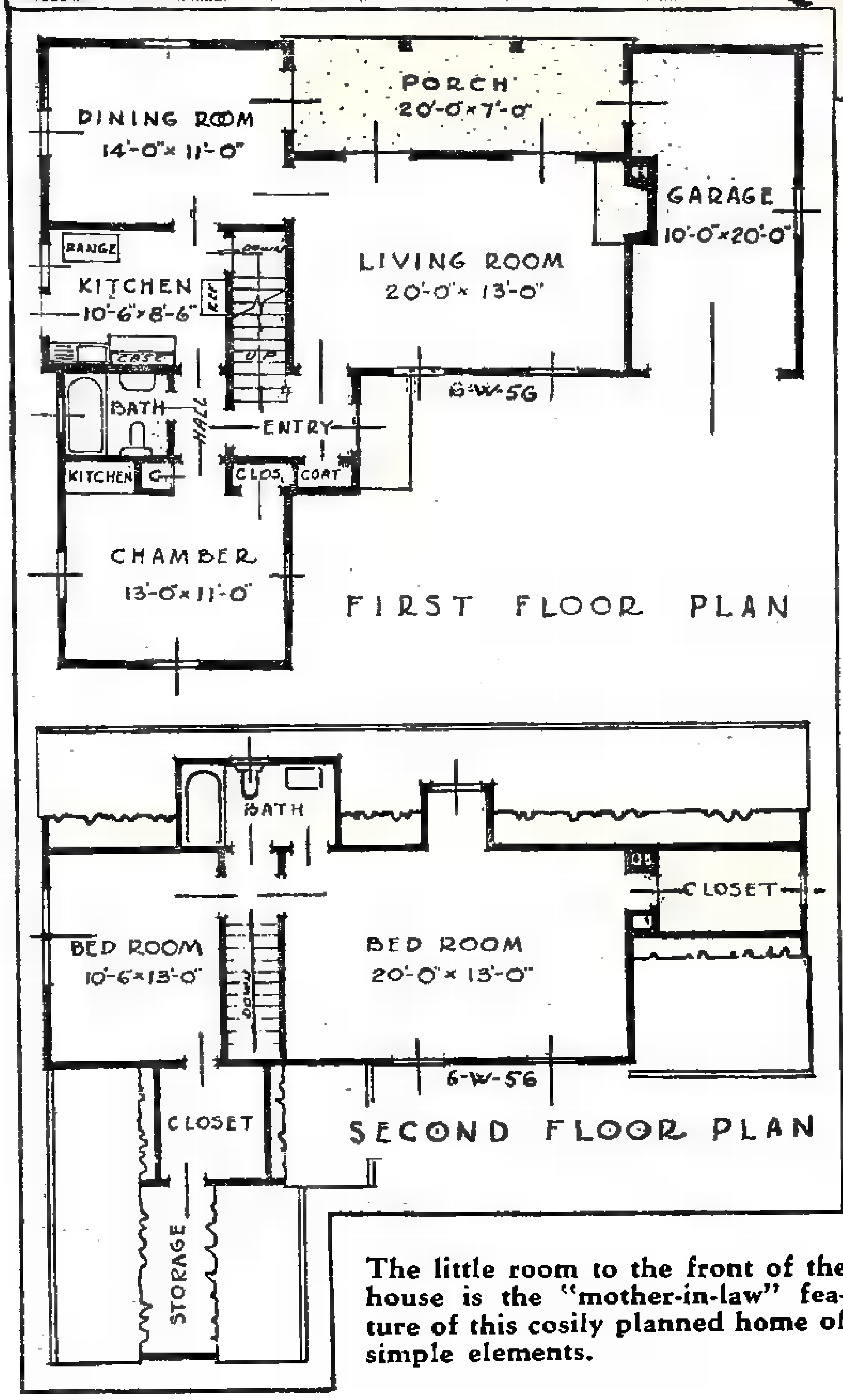

9"
2 3/4"
1 1/4"
3 1/2"
1/2"
3/8"
3/4"
Pitman
Position Of Uprights
7/8"
Strip Moves Back And Forth
Sand Block
Nail
1'-4"
13/16
Slides in Grooves
2"
1/2" Deep
Screw
Groove
Screw
7/8"
5/8
3 1/2"
1-Base
1/8"
1/2
3/4"
7/8" Dia.
6 1/2"
Main Drive Pulley
7/16"
1/2" Dia. For Eccentric
5 1/2"
3/4"
2-Eccentric Wheels
Maple or Birch
2 1/8"
1/2
1-Eccentric Shaft
4 1/2"
7/8
1 Main Drive Shaft
5 3/4"
3/8
Dowel Pivot Pin
10
Dowel holes
7/8" Dia.
3/4" Thick
2 1/2"
3 3/4"
2-Drive Shaft Support (white pine)

The essential elements of the eccentric sander are shown here. A small eccentric with 1" throw moves a Pitman crank and thus imparts to an arm sliding in a groove the necessary reciprocating motion.

A "Mother-in-Law" Home



Estimators say that this home can be built for about six thousand dollars, what with prices the way they are now.


PORCH 20'-0"×7'-0"
DINING ROOM 14'-0"×11'-0"
RANGE
KITCHEN 10'-6"×8'-6"
LIVING ROOM 20'-0"×13'-0"
GARAGE 10'-0"×20'-0"
6-W-56
BATH
HALL
ENTRY
KITCHEN
CLOS.
COAT
CHAMBER 13'-0"×11'-0"
FIRST FLOOR PLAN
BATH
CLOSET
BED ROOM 10'-6"×13'-0"
BED ROOM 20'-0"×13'-0"
6-W-56
CLOSET
STORAGE
SECOND FLOOR PLAN

The little room to the front of the house is the "mother-in-law" feature of this cosily planned home of simple elements.

by MAURICE I. FLAGG

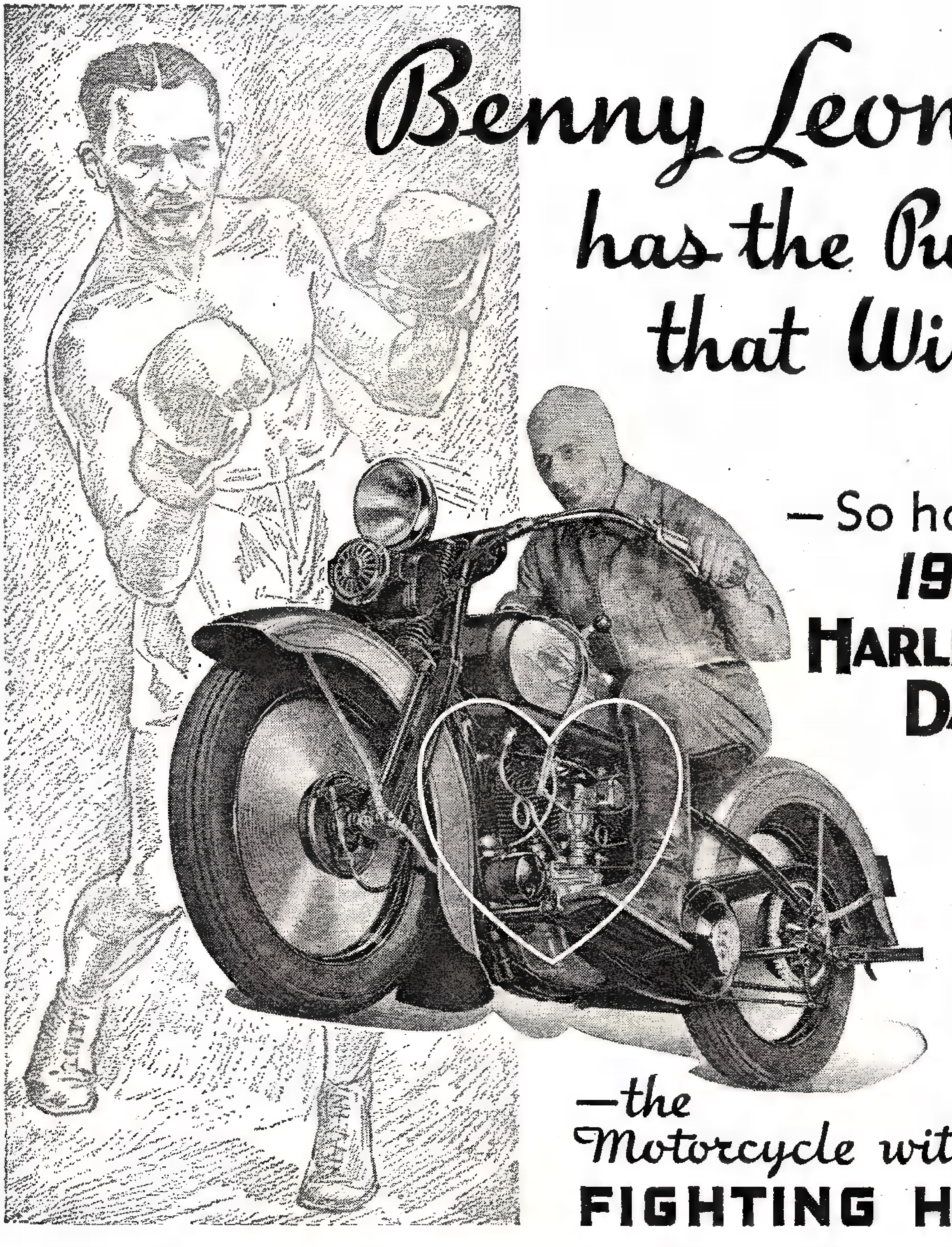
THE saying that "no house is large enough for two families," may, or may not be true. No one, however, will argue against the desirability of private quarters for a mother-in-law, a little place she can call her own with facilities for cooking and many other personal things which mean so much to one who has enjoyed all the privileges of a larger house but perhaps due to circumstances may have been forced to surrender them.

And that's exactly what house No. 6-W-56 provides. Namely: a "little house within a house." You will notice how cleverly the front room on the first floor has been planned. It is quite detached from the main house yet under the same roof. It offers not only sleeping accommodations but a pullman kitchenette, direct access to a private bathroom and, also, exit from the house without the necessity of passing through the main living quarters. Looking at this equipment from another point of view you will see how desirable such a one-room apartment may prove as an income producer.

The house itself is frame construction. A large livingroom, fireplace, dining room, well planned kitchen, open porch to the rear and enclosed garage complete the first floor equipment. There are two bedrooms, a bathroom, and unusually large closet space on the second floor. The house is what may be called a suburban type and will require a lot of 55 feet frontage.

How to Get Blueprints and Plan Books

A one-sheet blueprint of any house appearing in Modern Mechanix and Inventions magazine may be had for $1. Two new plan books, "Homes for Newlyweds," containing 32 of the latest ideas for low cost homes, and "16 Selected Homes for Lean Purses" containing time, space and labor-saving bungalows may be had for 15c each, or both books for 25c. Address Home Building Editor, Modern Mechanix and Inventions.



Benny Leonard has the Punch that Wins

— So has the **1934 HARLEY-DAVIDSON**

—the Motorcycle with the **FIGHTING HEART**

RETIRED undefeated Lightweight Champion of the World, Benny Leonard has the punch that wins—the power to smash on through to victory, no matter how tough the going.

The 1934 Harley-Davidson has the winning punch, too. Its marvelous TNT motor gives it power that laughs at hills and mud—36 eager "horses"!

It's a true Fighting Heart—like Leonard's—the heart of a champion. There's no quit in its make-up—but amazing speed, getaway, and dogged pulling power. Give it a trial and get the thrill of your life!

In comfort, ease of handling, classy Air-Flo styling and nifty color schemes, this great 74 Twin lives up to the promise of its wonderful motor.

See the new Twins and Singles at your nearest Harley-Davidson Dealer's. Ask about his Easy Pay Plans.

MAIL THIS COUPON

Harley-Davidson Motor Co., Dept. MM., Milwaukee, Wis.
Interested in the "Fighting Heart." Send illustrated literature.
Postage Stamp is enclosed to cover cost of mailing.

Name________________

Address________________

My age is ( ) 16-19 years, ( ) 20-30 years, ( ) 31 years and up, ( ) under 16 years. Check your age group.

40
WITH
The
COLLECTORS

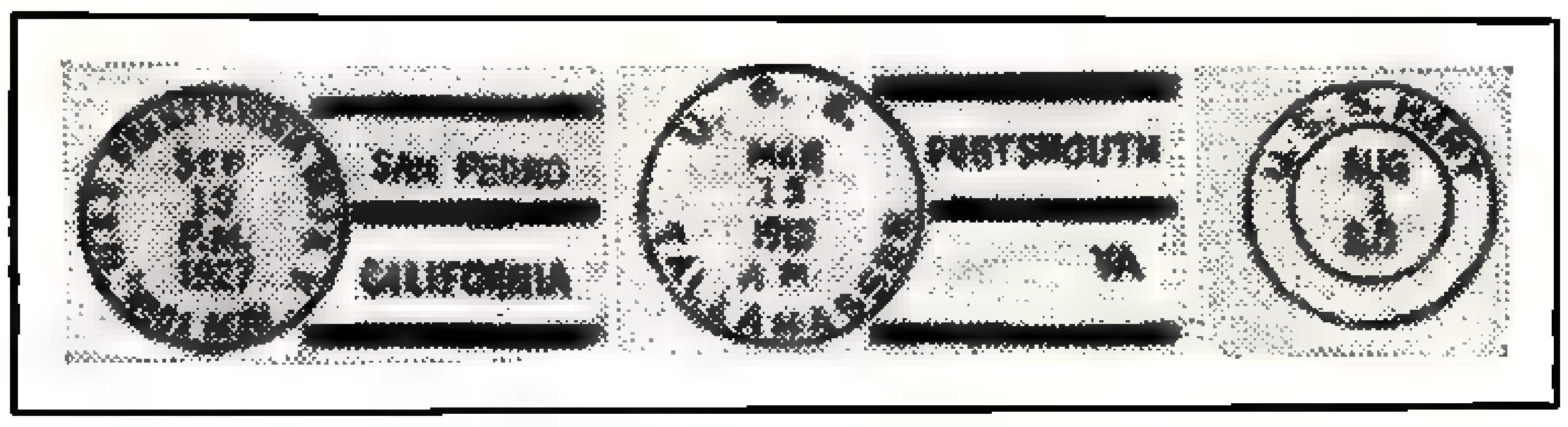
Naval Covers Are Interesting

STAMPED covers from each of the 347 ships in active commission for Uncle Sam on the high seas make an interesting collection, and show in a novel way the strength of our naval forces.

A definite scheme is followed in naming navy ships, battleships being named after states, cruisers after cities, and submarines after fish. Destroyers take their names from deceased naval heroes, the last or full name being used. River gunboats, such as protect our interests on Chinese rivers, are named after our island possessions, and mine sweepers after birds. Oil tankers derive their names from rivers flowing through our oil-producing states, while repair ships, as the *U. S. S. Medusa,* are named after mythical persons or places. Indian tribe names are used for ocean tugs; the *U.S.S. Nitro* is an ammunition ship, and the *U.S.S. Relief* is a hospital ship.

Many navy ships use artistically designed cachets in different colors for cancelling mail on Navy Day and on holidays.

Naval covers can be obtained by sending self-addressed, stamped envelopes through the proper ports of call to the different ships.



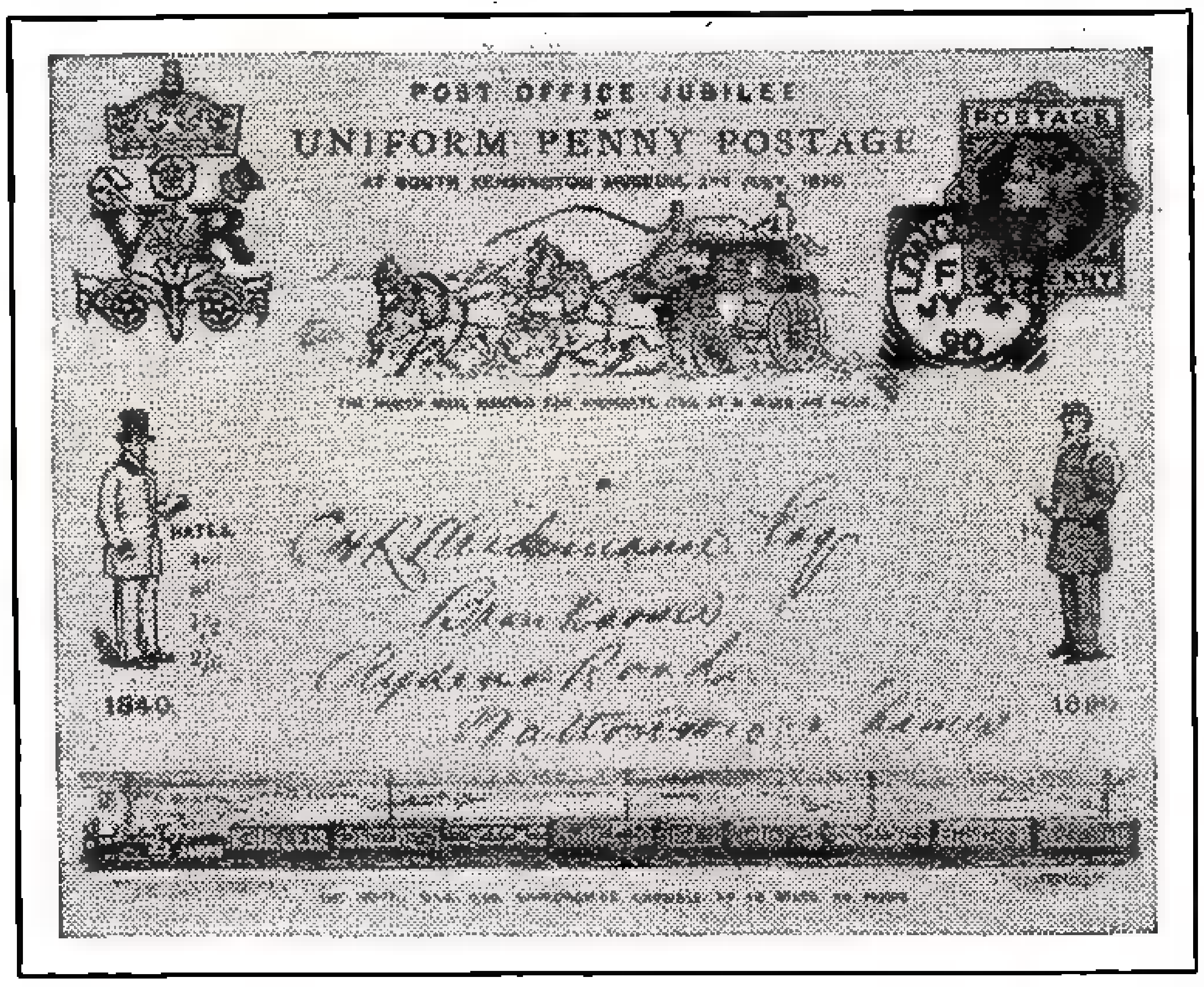
Some postmarks of our navy—from battleship U.S.S. Pennsylvania, cruiser U.S.S. Tallahassee, and destroyer Hart.

Old Cover Shows Mail Carriers

AN INTERESTING cover put out by the English postoffice department in 1890 to commemorate the 50th anniversary of penny postage shows the progress made in mail transportation in 100 years. It is one of the first illustrated envelopes to be issued, and is highly prized by stamp collectors.

Just above the address box is a sketch of the North Mail stage coach as it rolled along at 8 miles per hour in 1790. At the bottom is the North Mail of 1890, a long steam train capable of 48 miles per hour.

Sketches of postmen of 1840 and 1890 seem to indicate they were better dressed in the old days.



Old illustrated cover commemorating 50th anniversary of England's famous "one penny black," showing old and new in mail carriers. Note that date is July 4, 1890.

ADLETS FOR HOBBYISTS

COINS

COINS, California gold quarter size 27c; $½ size, 53c. 3c piece and coin catalogue, 10c. 200 different stamps and stamp catalogue, 10c. Norman Shultz, Salt Lake City, Utah.

STAMPS

ZANZIBAR! Packet queer freakish stamps from Zanzibar, Algeria, Sudan, Malay States, Victoria, Gold-coast, Nigeria, British Colonies, Souamericans. Don't delay! Don't wait. This whooping packet free for 5c postage. Gray Stampco, Dept. M.M., Toronto, Canada.

STAMPS! 100 diff. 2c; 500 diff. 35c; 1,000 diff. 90c. Tatham Stampco, D9, West Springfield, Massachusetts.

HEADQUARTERS—Magnificent Penny Approvals. Low price sets. Complete Service. Elyria Stamp Company, Earlcourt, Elyria, Ohio.

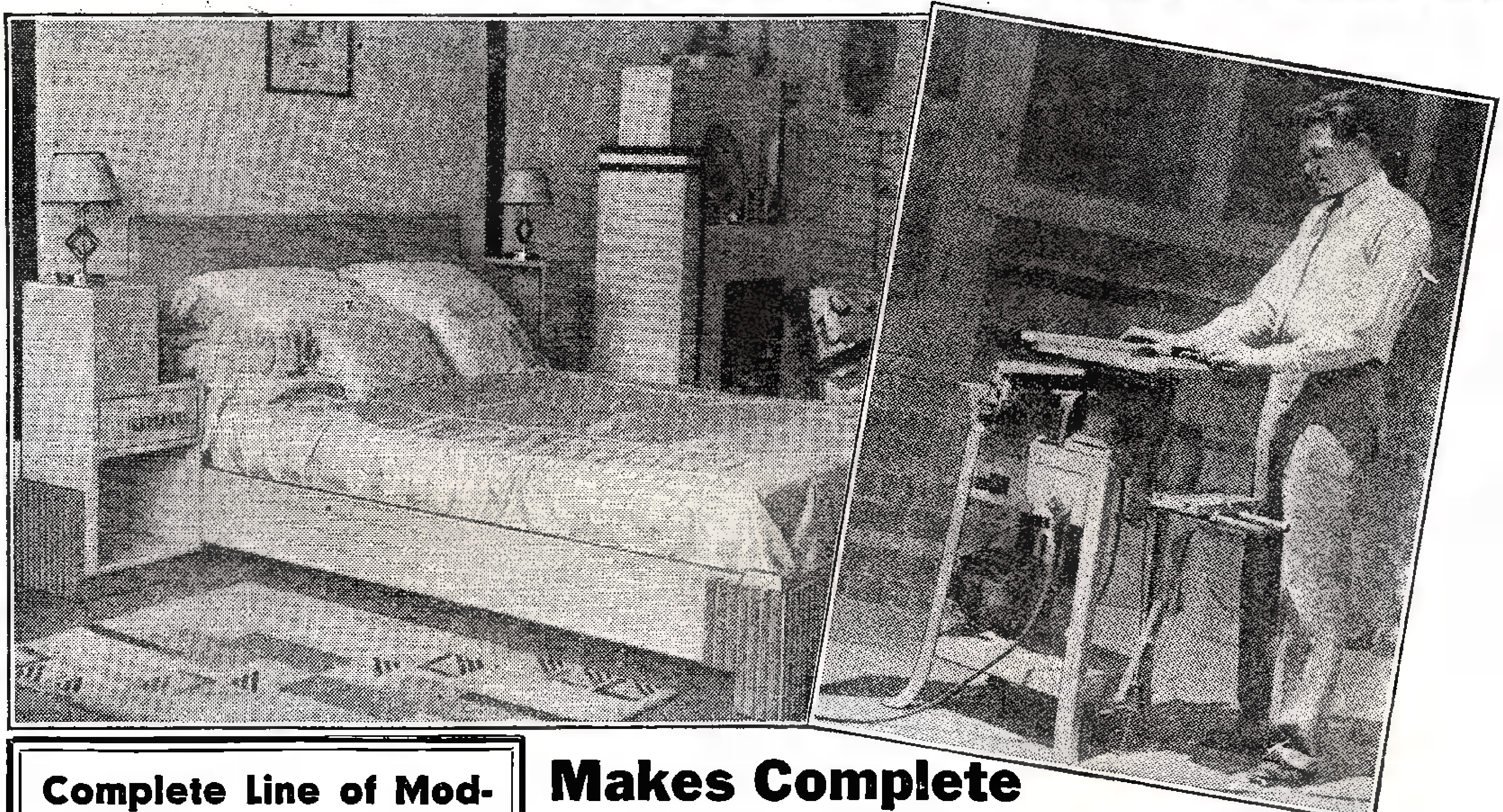
250 STAMPS 10c; with approvals. Harold Bowen, Fort Dodge, Iowa.

WE BUY stamps. $10.00 to $5,000.00 each paid for old stamps. Buying catalogue 25c. John Chico, 127 Farmington Ave., New Britain, Conn.

1863 LOMBARDY-VENETIA, Corea, Marienwerder, Afghanistan, Surinam, Allenstein, genuine Baden, and $5 U. S.—Absolutely free to approval applicants enclosing 3c postage! Viking Stamp Co., Dept. M, Sheepshead Bay Station, Brooklyn, N. Y.

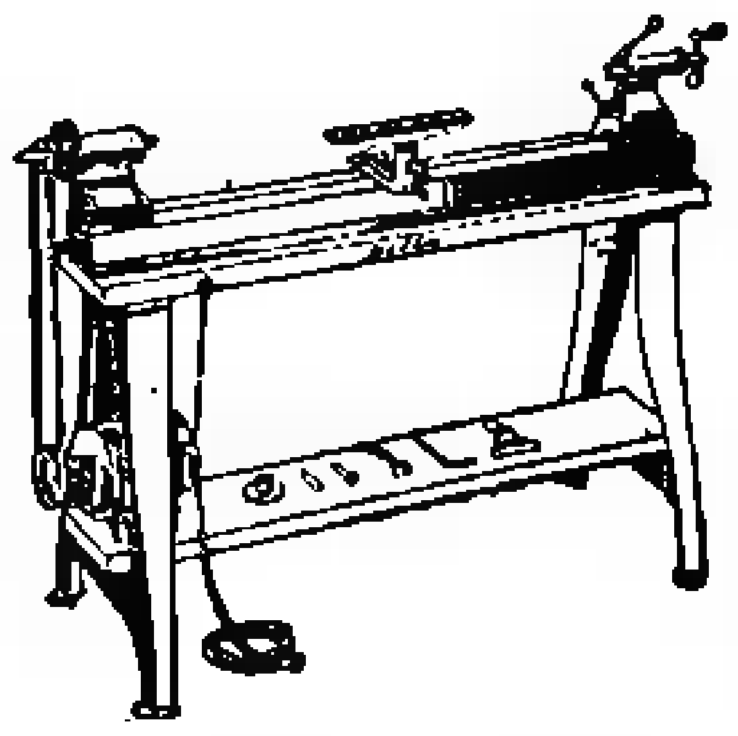
TRIANGLES & 60 different stamps from Liberia, Charkhari, Nyassa, Saar, Tanna-touva, Azerbijan, etc., 7c. Gardner, 5220-Cuthbert, Baltimore, Md.

What One Man Did with "Delta" *Motor-Driven Tools*

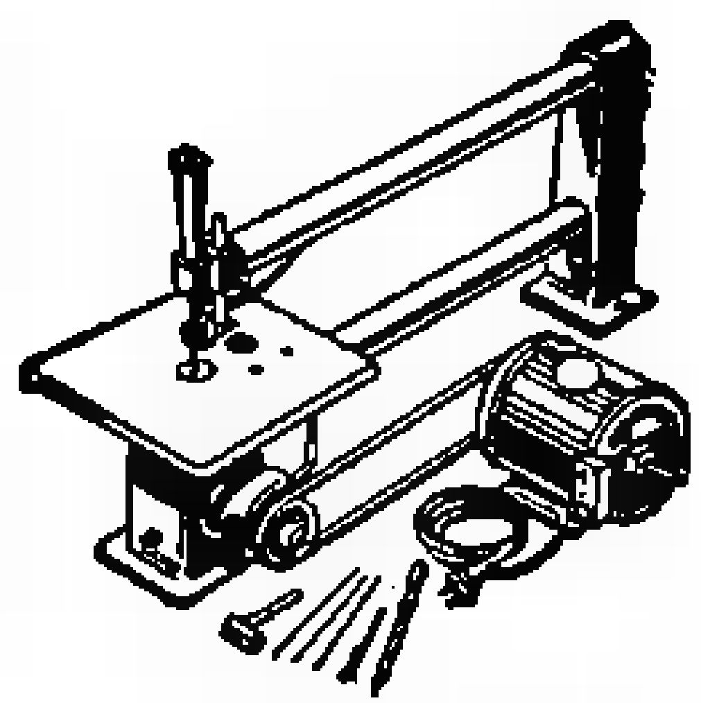


Complete Line of Modern Motor-Driven Tools

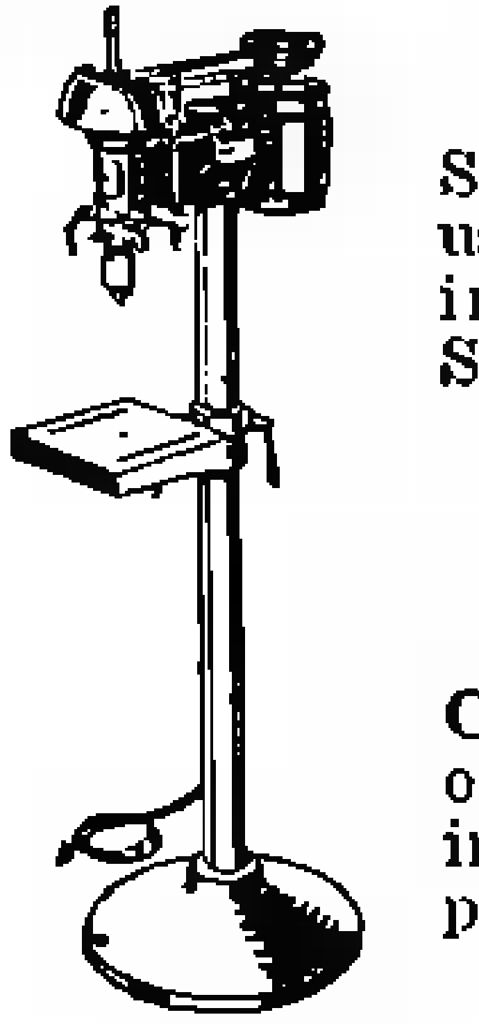
New improvements and new features make the complete 1934 line of "Delta" Motor-Driven Tools of unusual interest to all Woodworkers. The "Delta" line includes: **Jointers, Circular Saws, Band Saws, Scroll Saws, Drill Presses, Woodturning Lathes, Boring, Routing, Sanding, and Mortising Attachments, and a complete line of accessories.**



"Delta" Woodturning Lathe
Four-speed, substantially made, at surprisingly low price. Has many special features.



"Delta" Scroll Saw
Revolutionizes Scroll Saw work. Runs at full motor speed — 1,800 strokes per minute — with no vibration. Smooth-cutting. Many novel features.



"Delta" Drill Press
Six tools in one! Can be used for Shaping, Mortising, Boring, Routing, Sanding, and Carving.

Combination Unit
(Illustrated above with Mr. Wheeler)
Circular Saw and Jointer on convenient stand. No interference. Compact — portable.

Makes Complete Modern Bed-Room Suite

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Model of Dirigible U. S. S. Macon

(Continued from page 105)

The propellers, .4" long, are cut from light sheet brass or copper, bent to shape, and soldered to the housing. A small drop of solder placed at the center can be filed to represent the propeller hub cap.

Four propeller outriggers are mounted on each side of the ship, just below the radiators. The radiators, being flush with the hull, can be made by scoring the hull lightly with a knife point to form the corrugations.

The mooring ball at the nose is made by bending a pin at right angles and placing a drop of solder on the head. The hull, control surfaces, and control car are painted with aluminum paint.

The triangular mooring mast can be built from radio bus wire, with soldered joints. The two wheels at each corner are cut from ⅛" brass rod, with holes drilled in the center to take axles cut from small pins. The wheel housings are bent from sheet metal, drilled for the two axles, and soldered to the mast.

The mooring cup in the top of the mast is a ball of solder, hollowed out to take the mooring ball.

To make the model stand upright on the mantel, insert a length of bus wire in a hole drilled in the hull, and bend to form an additional support.

Light Plane Ribs in Metal

(Continued from page 111)

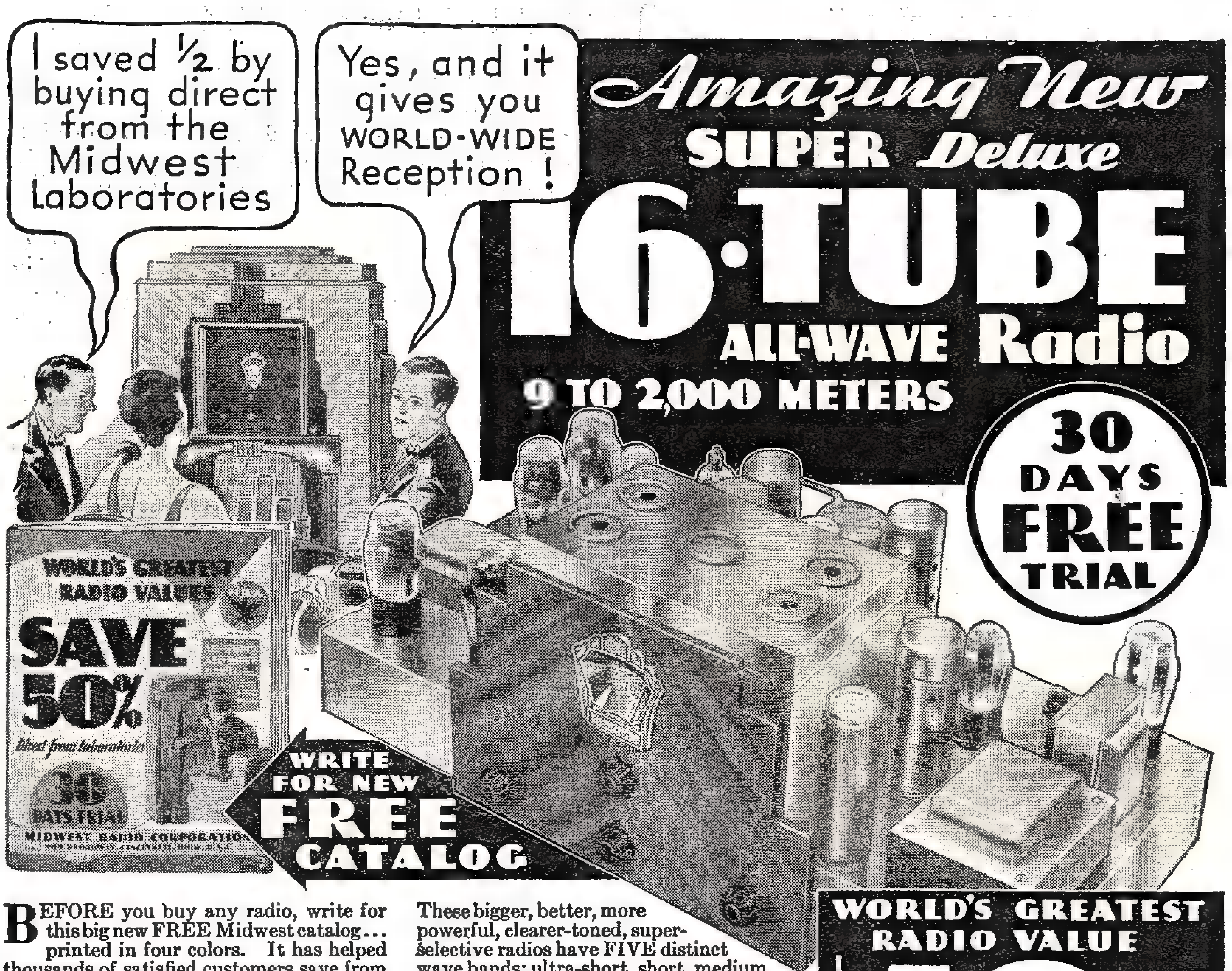
bent over. The ends of the diagonals are simply and easily flattened in a vise. Nothing hard about that.

The top, and, if necessary, bottom chord members are made by rolling fixture shown on the drawing. The roller rotates on the handles and may be greased to make it roll easier. The chord member is bent to the proper curvature by inserting one end under the steel strap shown, and bending it around the form by pressing and pushing the roller along it. The form block is made long enough to roll a piece going from the nose piece to the trailing edge. The chord is successively rolled until the chord piece fits the rib jig when removed from the form block and tried. It is necessary to use this cut-and-try method, as well as making the form block of greater curvature than the finished rib, due to the spring of the material. Local high spots may be rolled to get the chord to fit all along the jig.

The jig used to try the rolled chord member in is the same jig used for the construction of the rib. This jig is made the same as for wooden ribs, so you know all about that end of it. If not, look up back issues of our magazine.

The spruce trailing edge block, which is made by hand, is drilled for the trailing edge wire that is generally used. Also use tape bridging between ribs the same as you always do when assembling the spars (or beams) and ribs.

Oh yes—the material used. Full information on the section and material used may be obtained from the Aluminum Co. of America with offices in all big cities.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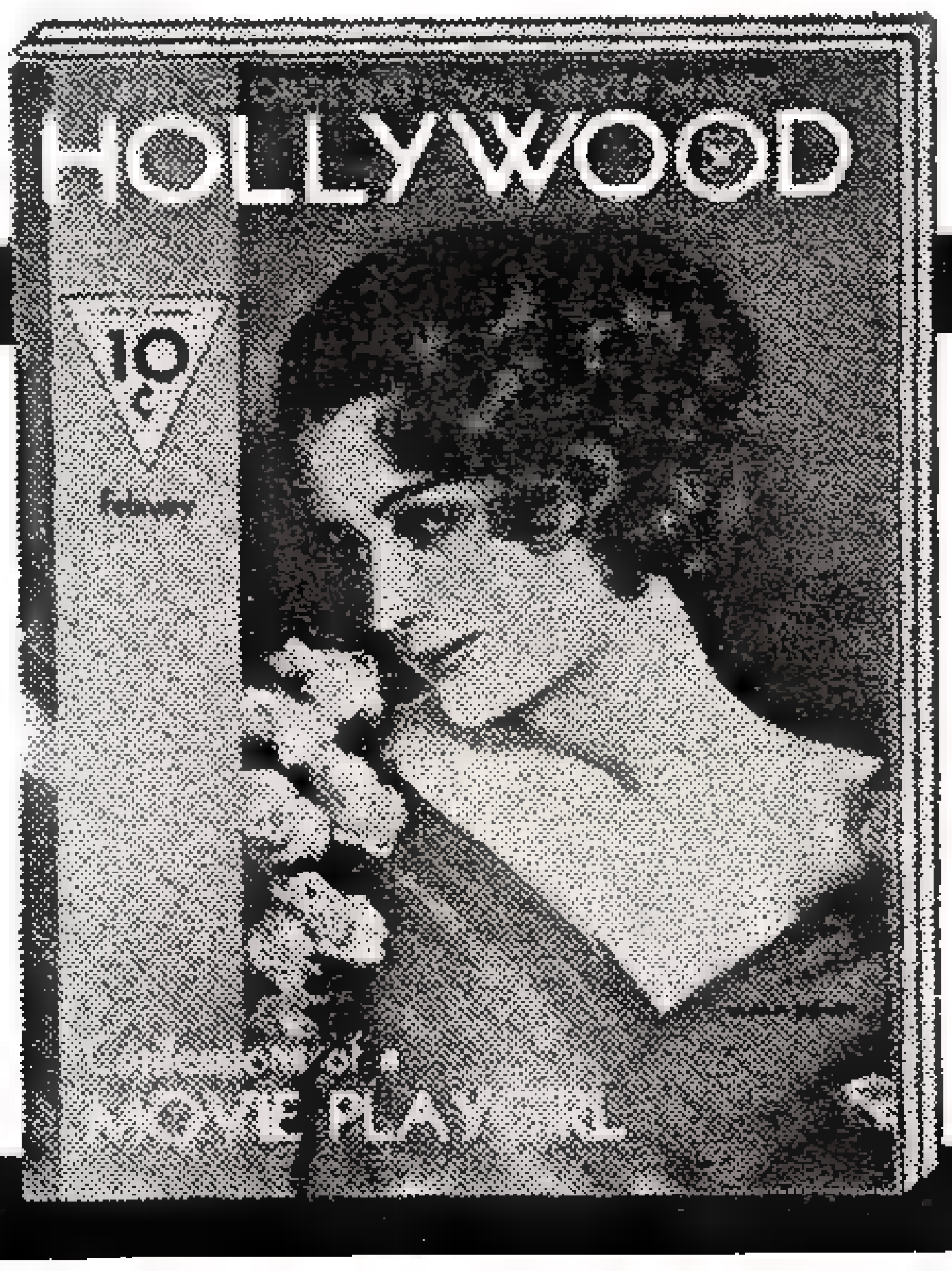

Look For This Cover

Fine Fun With Simple Toboggan

(Continued from page 93)

The boards should be water-soaked, then mopped with boiling water thoroughly before attempting to bend them. The accompanying illustrations show how to bend the frame. Bend carefully applying boiling water, to prevent cracking the wood. When sufficient bend is secured, the handles of the roller may be tied to the frame, and left to set.

The next requisite is to cut four cross bars, 14 inches long, preferably out of half round, 1¼-inch in diameter. Square material may be used by planing off the top edges. Cut one-half grooves in the bottom of the bars, about one inch from each end. After the boards are thoroughly dry and the bend set, put on the cross bars, spacing equally apart. The back one should be two inches from the end. Two half rounds should be fastened to the end of the front curve. These cross bars should be put on with 1¼-inch wood screws, from the bottom, heads counter-sunk.

Bending Bottom

Next take a length of codfish line, or hemp cord, tie the end securely to the end of the cross bars on the bend, through gimlet holes, then pass the cord down to the first cross bar on the bottom, draw tight and secure in a slip-proof knot, to hold the bend in shape. Continue on with the cord passing through the groove of the next cross bar, loop and on to the last one, cross to the opposite side, and finish up at the bend. This cord is for the purpose of attaching tie thongs in fastening bundles or duffle bags to the toboggan.

The bottom of the toboggan must be sand-papered smooth, and if one has a grooving instrument, a couple of grooves lengthwise on the bottom will help prevent the toboggan slipping sidewise on the trail.

If the bottom is treated with a coating of hot pine tar, it will run better and last longer. The tar should be boiling hot when applied; also heat the bottom of the toboggan, and let the tar cook in. Wipe off surplus before drying. Another dope that may be more easily prepared is made of three parts rosin, two parts beeswax and one part tallow. Mix and melt these ingredients together and apply while hot, same as the tar.

The draw cord should be fastened at each end of the front cross bars. A broad leather strap with a felt lining should be slotted at each end and slipped over the cord for a head or shoulder pad.

Shotgun Recoil Contest Winners

(Continued from page 65)

as in the case of the barrel with the blank shell. If we let X equal the kick due to the column of air, then in the vacuum the kick of the blank shell will register 1—X units, and the kick of the loaded barrel 10—X units.

More than half the answers were to the effect that the gun would not go off in the vacuum because of the lack of oxygen. A study of the chemical nature of gunpowder will show, however, that the necessary oxygen is supplied by sodium nitrate, one of the constituents of the gunpowder.

Roosevelt's White House Hobbies

(Continued from page 33)

In the group of paintings and models above the fireplace in the President's study, one painting in particular is outstanding, because it is understood to be his favorite. This is an original, a gift from the noted artist, Charles Ruttan, and shows the destroyer "U. S. S. Dyer," as she looked fully camouflaged, arriving in the Azores. "The Dyer" was the vessel in which Mr. Roosevelt, then assistant secretary of the Navy, went to Europe during the World War, for an inspection tour.

On the mantelpiece of the fireplace is a model of the "Amberjack II." This model was given to the President by a close friend and represents another favorite diversion of Mr. Roosevelt, sailing in the open sea.

Interesting Ship Models

The actual "Amberjack" is a 45 foot sea-going schooner, used by the President and his sons, Franklin, Jr., and John, both under 20 years of age. Last summer after the strenuous campaign preceding his election and the first trying months of his administration, the President and his sons slipped away for a leisurely cruise up and down the New England coast. They did their own navigating and their own cooking. The President returned happy and cheerful, the picture of buoyant health and deeply tanned.

In a large glass case in the President's study, next to a window overlooking the Washington monument, is an interesting assortment of eight models. Outstanding in the group are two models of the "Mayflower," the historic ship that carried the Pilgrims to America. The models, it is said, are exact replicas of the seventeenth century sailing vessel.

President's Stamp Specialties

Also in the case are models of a whale and a swordfish; "La Provence," modern French liner; the "S. S. Olympic"; the "S. S. Mauretania"; and the "Malcolm L. Cropley," an early American brig.

One of the latest additions to the President's collection of paintings is an original showing the "Gertrude L. Thebaud," the famous fishing smack that visited the World's Fair in Chicago and won the North Atlantic supremacy in a thrilling race last summer. Ben Pine, noted Gloucester captain of the sailing vessel, presented the painting to the President.

Mr. Roosevelt stands well in the front rank of American stamp enthusiasts. He specializes in stamps of the West Indies, Central and South America. He has two volumes entirely dedicated to the Dominican Republic and a number of rare early Haiti stamps.

Actually, though, his interest in philately is general. He has a dozen volumes of general material as well as four volumes of miscellaneous "scrap items" of recent date. His United States stamps fill two volumes. Covers of different varieties and degrees of importance make up three volumes. In the last named group are envelopes from various celebrities, including high government officials, navy officers, diplomats and publicists.

Because of his association with the navy, Mr.

(Continued on page 127)

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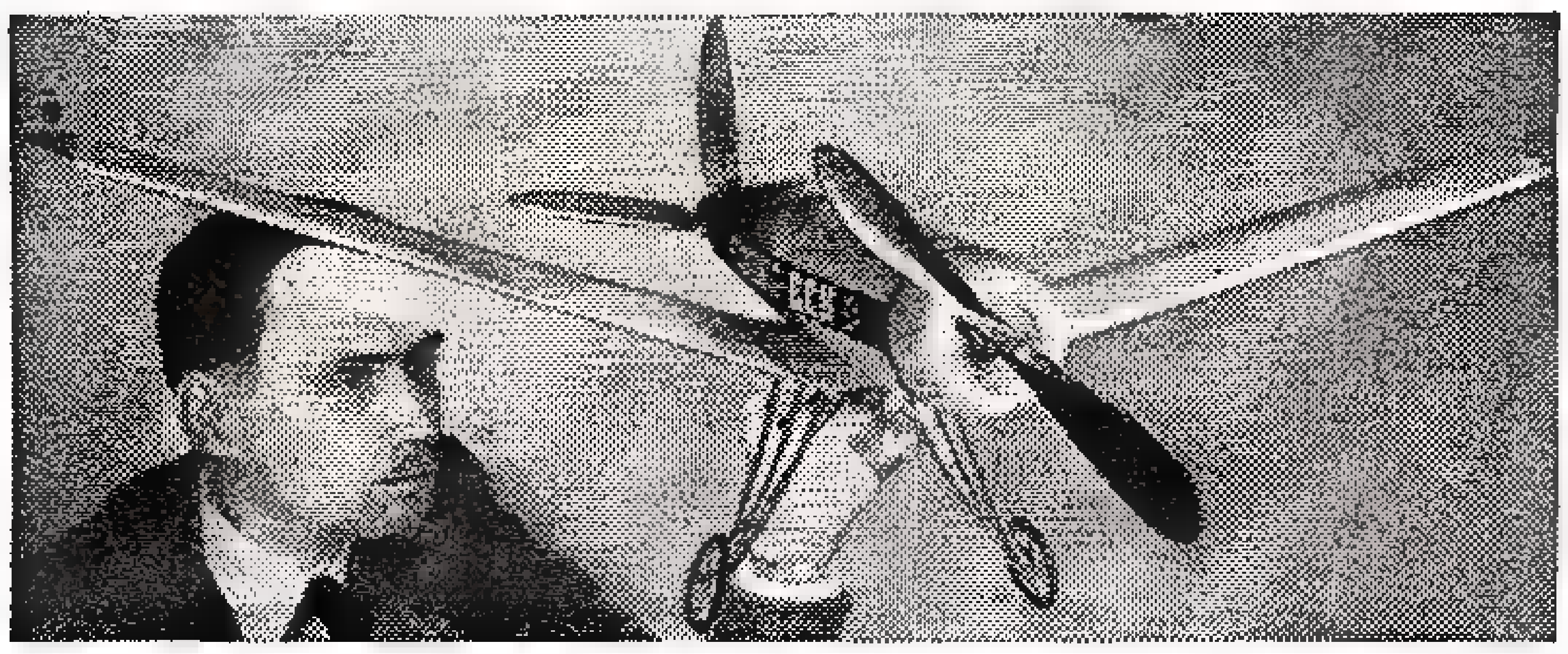

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Simple Memory Feat Amazes Guests

(Continued from page 81)

concentration will be necessary when this is done. If the trick is to be most convincing, the mind should work fast, the faster the better and the more confusing to those who happen to be watching or joining the contest. Some people will be able to master the code in an hour of concentrated study while others may require two or three hours of study. At any rate when the thing is mastered the trick becomes disgustingly easy and even the rankest amateur performer may put on a most interesting and astounding performance.

And now for the method. Let it be assumed that the following words form the first part of the list of 30 that is to be given: Automobile, Locomotive, Airplane, Box, Blanket, Cow, Glasses Watch.

How to Use Memory

First, it should be kept in mind that the first letter of the words that are given is not important and no attention is to be paid to it for it has no bearing on the system whatever. When each word is given, the performer should immediately associate the object represented by the word with the object that has been memorized and a mental picture of the two immediately formed and concentrated upon for a brief period. The same is done with every word. As an example: The first word is automobile and the first word in the alphabet list is anchor. We instantly form a mental picture of an automobile going down the street and towing a large anchor. This is an incongruous picture, but that makes no difference.

Form Mental Pictures

Next, we come to the word locomotive and this we have to associate with the second word of the list, barrel. Well, we might place the barrel on the stack of the locomotive and remember it in that way or we might place the barrel on the front of the locomotive in place of the headlight. The word airplane must be associated with the third word of the list, coat. When this is mentioned we might think of an airplane dashing through the air with a coat tied to it and fluttering in the tail breeze. This process of association is kept up right on through the list and if a small instant is used to impress the mind with these picture combinations and if the list has been memorized thoroughly, the performer will be able to instantly recall the whole list of words while his friends, not a wit less clever than he, will probably recall the first few words and then stumble on to a sad defeat in the memory game.

The performer adds a great deal to his glory when he asks the person who formulated the list to pick out random numbers and he will give the proper word. In this connection, his mind works in this way: The word may be the twenty-third one. Twenty-three represents the letter W in our list and this in turn represents the word wheel. When the person calls "twenty-three," the performer immediately thinks of W and then of wheel and then of the particular object that was associated with wheel when the test began. In this way he can flit about the list and give words that would seem to be quite beyond all human attainment.

Youth Designs Radio Phone

(Continued from page 83)

From that conference between the high school student and the "scientific" police chief, now a world renowned criminologist, was born the Berkeley police radio system—first police radio on the Pacific coast and a model for those since established in other western cities.

After installing the police radio, Tibbetts went back to his attic room and plunged anew into his experimental work.

Second in Edison's Contest

Shortly afterwards, he took time off to enter the late Thomas A. Edison's "national intelligence contest," in which he came out second in competition with thousands of the brightest young intellects in the country.

On completing high school Tibbetts took up electrical engineering at the University of California where, immediately after admittance, he was elected vice-president of the college branch of American Institute of Electrical Engineers.

A few weeks ago, engineers of the huge San Francisco-Oakland bay bridge, which will be five miles in length, were ready to begin actual construction of the gigantic project.

They had solved engineering problems never before confronted by bridge builders. Yet there was one problem which had not entered into their calculations.

How were they to communicate with one another while directing work on the structure—work which was to proceed simultaneously on a dozen different fronts?

Instant, dependable communication facilities were imperative, but the ordinary telephone was impractical because of the fact that it was necessary to speak to men aboard launches, tugs and other types of mobile equipment.

It was here that Tibbetts entered the picture. He placed before Earl Lee Kelly, director of public works for the state of California, and C. H. Purcell, chief engineer of the bridge, a proposal by which very high frequency radio telephones would be installed to solve the vexing problem of prompt communication from isolated and moving construction points.

Solves Communication Problem

Tibbetts suggested simple, inexpensive, especially manufactured equipment made from his own design after consultation with Charles L. Watson, president of Western Wireless, Ltd., of San Francisco, and Frank C. Jones, chief consulting engineer of the company.

The upshot was that Kelly and Purcell gave Tibbetts a contract for the installation of 22 ultrahigh frequency radio telephones, to be placed at designated points in the bay and along the course of bridge construction.

Tibbetts obtained the services of two "pals," and started to work. His assistants are Charles Simpson, University of California student and Charles Patterson, who enters the university soon.

Tibbetts' equipment operates on frequencies of 41,000, 51,400, 61,000 and 63,000 kilocycles.

Provisions for the use of such high frequency radio were not included in regulations of the Federal Radio Commission and it was necessary

(Continued on page 124)

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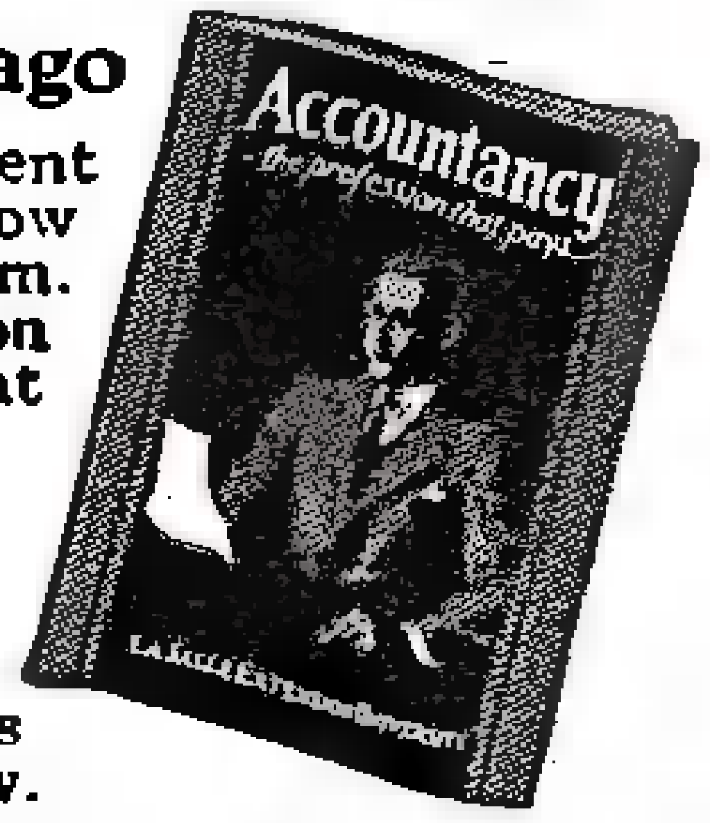

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30x5.00-20	2.85	1.05
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Youth Designs Radio Phone

(Continued from page 123)

for the bridge contractors to secure special permits.

Use of the equipment is limited to visual range, since the short waves approach light waves in their effect.

Tibbetts' entire transmitter and receiver is only 14 inches long and 8 inches square. The tubes are all of receiving type, while the usual radio transmitters use special and expensive tubes.

The antenna is simple and takes up little room, a desirable feature on a small tug or within a limited construction area. The antenna, a half-wave vertical radiator, consists of a rod less than 12 feet in length, the length depending on the exact frequency employed.

The receiver construction is standardized. Power is obtained either from the ignition battery supply of mobile equipment or from a lamp socket where lighting current is available.

Calling is done on a stand-by loud speaker, any station wishing to call another speaking the call letters or location of the point desired, into the microphone. The called station answers in the same manner.

Where only one frequency is available communication may be carried on by use of a single simplex channel—that is, the same wave length in both directions.

The focal point from which orders will flow to bridge workers is at bridge headquarters, Clay and Sansome streets, San Francisco. The building is in full view of all bridge construction areas.

After completing installation of the equipment, Tibbetts has agreed to train 60 men in its use.

Build This Wee Steam Engine!

(Continued from page 99)

the drills. After this is done an end mill may be substituted for the chuck and the end of the main bearing machined. A heavy cut and then a very light finishing cut should be taken. Then the bearing face is machined so that it is just 3/10 of an inch back of the end of the main bearing. After this the piece may be turned around and the main bearing machined to specifications.

If no milling attachment is available, the piece may be clamped to the tool slide and shimmed up until the line of centers of the lathe intersects and is perpendicular to the center-line of the piece. The face must be adjacent to the head-stock. The holes along the center line may be drilled and the faces machined as before, using the lateral feed to determine the distance between the face and the end of the main bearing. The order of machining is the same except that the ports must be drilled with a hand drill. This completes this part except for the lapping of the cylinder face on the standard face, which is done when the engine is completed and assembled.

The next piece to consider is the cylinder. It is made from a brass casting and machined on the inside only. The pattern is made exact size and a core print made to make the cylinder hollow.

Fillets of wax are applied to all angles as before described. It is chucked in a three-jaw chuck and the cylinder is turned out to the required dimensions. It will be lapped later when it is

Build This Wee Steam Engine!

complete and the piston is made. The last cut should be very fine with a very slow feed. Then it can be clamped in a V block and the bearing face filed carefully until it comes to dimensions.

The finishing is best done by rubbing it on a flat piece of carborundum cloth. It will later be lapped as described under the description of the base. The hole to take the bearing bolt and the steam ports are next laid out and drilled.

The twelve holes to hold the cylinder heads may be drilled and tapped to whatever size will be satisfactory.

The stuffing box is the next thing to consider. It is made from machine steel or brass and machined all over. The thread can be put in with a special tap designed for shallow holes or can be turned on a lathe. The two (2) cylinder heads are machined out of brass and drilled as per dimensions. The lower head has a small collar on it which is threaded to meet the stuffing box. Angles are countersunk in both parts 60° with the plane of the cylinder head. (This holds the packing.)

The piston can be turned from a piece of cast iron or mild steel and it is machined all over. It has a tolerance of one-thousandth of an inch in the sketch but that is not a hard and fast dimension. The best bet is to lap it in until it is a fairly loose fit and take care of the tolerance with a piston ring.

The piston ring is turned from a cast iron pipe and split after it is turned. It is turned oversize and split and then the ends are filed until it fits the cylinder nicely.

The piston rod is turned from a single piece of brass to suit dimensions and threaded on the top for a small nut to retain the piston.

This completes the cylinder assembly except for the piston bearing bolt or stud, according to how the constructor has made it, and a spring to hold the cylinder against the base. This should be strong but not so strong as to impair the motion of the cylinder when it oscillates. Now that both the base and the cylinder assembly are completed, they may be lapped together using a very fine lapping of valve-grinding compound.

The crank shaft is of the built-up type, as per drawing. Machine steel is preferred.

The flywheel is rough machined from brass and pressed on to the end of the crank-shaft.

The manifold can be made any way the constructor sees fit. The diagram is only a suggestion.

There is a great deal that can be changed but the holes for the intake and exhaust of steam must be exactly as the sketch shows. The intake holes are the two countersunk holes through the standard that open on the face for the cylinder bearing.

The author will answer all correspondence on this subject gladly. Address N. A. Welch, 202 Grosvenor St., Douglaston, L. I., N. Y.

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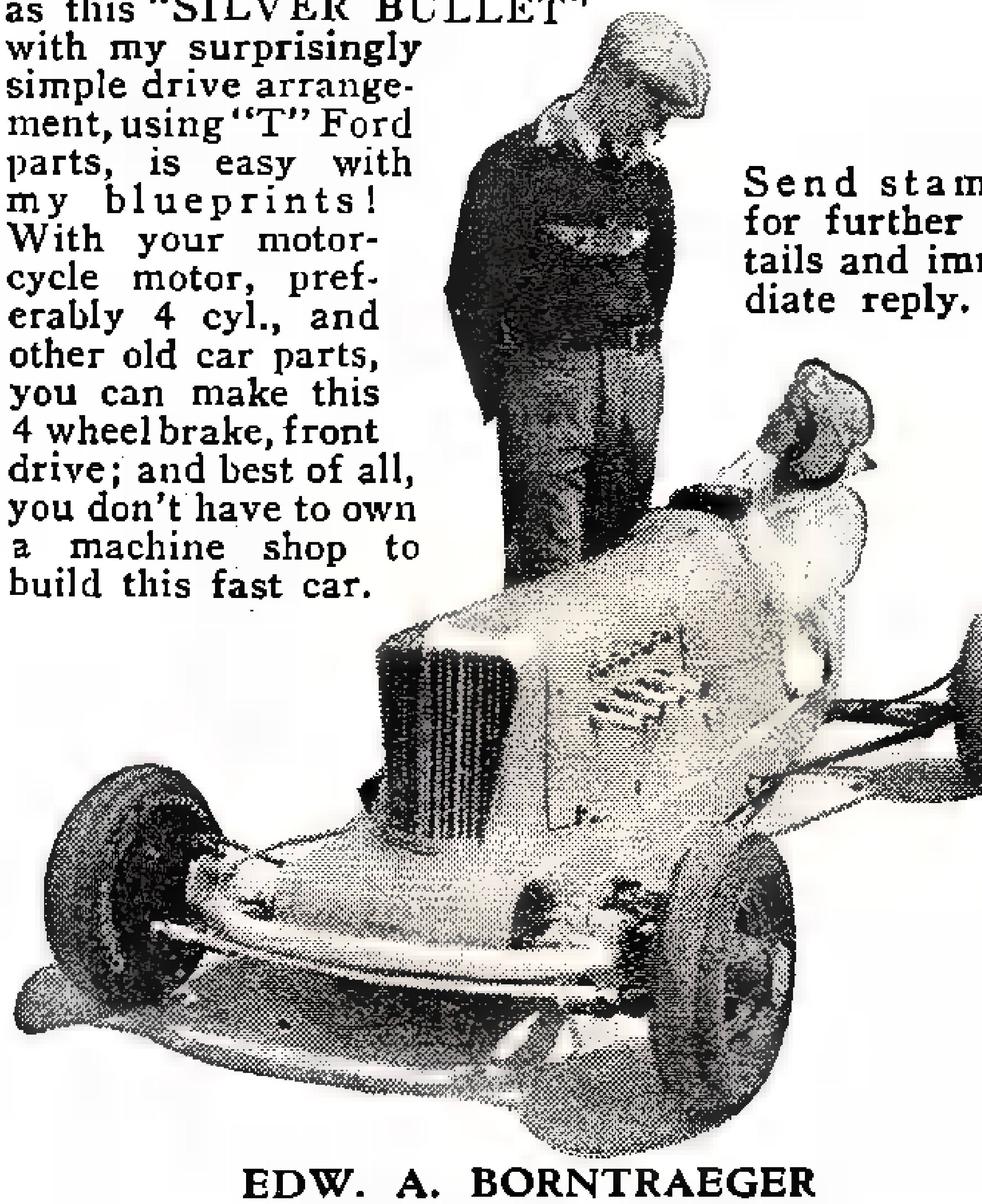

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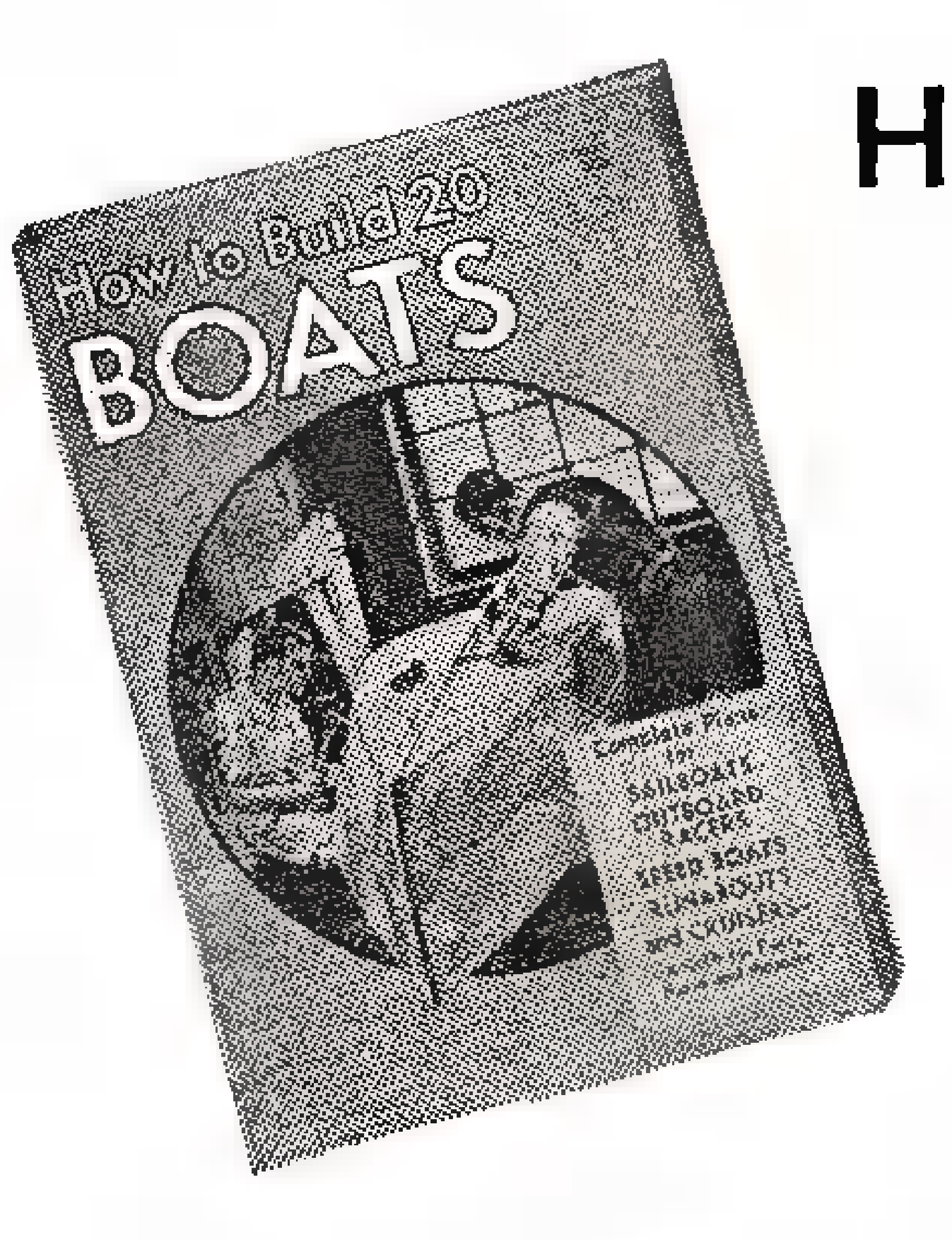

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Build an Eccentric Shop Sander

(Continued from page 113)

lips each side of it were ⅛ inch thick.

Before removing this from the face plate a hole is cut in the center, with chisel held to cut a true hole, ⅞ inch in diameter.

Two other wheels are also needed for the sides of the eccentric. These are cut from ¾-inch thick stock 3½ inches in diameter, each exactly alike, and before removing, they are sanded and a ⅞ inch hole put squarely through the center of each for the main shaft also. After removing from the lathe, the chuck is put on the shaft, a ½ inch bit inserted, the two wheels clamped tightly together and a ½ inch hole bored through each, midway between edge of center hole and rim. The short shaft which actuates the pitman goes through these.

Construction of Sander

With the ends of this 2⅛ inch length shaft covered with glue, the two were connected. While the glue was still soft, the center holes of the wheels were also coated with glue and the main shaft driven through the wheels. The pulley wheel was also glued on the main shaft, 1 inch from the extreme end.

During this interval the frame, pitman and sliding stick were made. The uprights are two pieces ¾ inch thick, 2½ inches wide and 10 inches long. A ⅞ inch hole was bored through the top of each. The pitman is constructed as shown with a slot in the upper end 9/16 inches wide and 3½ inches long.

The base is a piece of scrap. It was reduced to 16 inches in length, 3½ inches in width and its thickness is 1 full inch. ⅝ inch from one edge a groove ½ inch deep and ⅞ inch wide was cut. This groove forms the seat for the sliding piece which is actuated by the pitman and carries the sandpaper block. The front end of this was provided with a slot to accommodate the lower end of the pitman.

Assembly of Workshop Device

When the glue job had thoroughly dried, the shaft reseated between the lathe points and the lathe started in low speed and the wheels again trued up. (Sometimes slight warping occurs due to the glue moisture or too snug a seating.) Then the lathe was stopped and the portion of main shaft between the small wheels was sawed out. The parts are now ready for assembly. The shaft fits through the upright bearings and the lower ends are nailed and glued to the front end of the base as indicated with a try square to insure accuracy. The sliding stick, ⅞ inch high and 13/16-inch wide, with a length about that of the base, was put in the groove and the lower pitman end inserted in the front slot and a 4 penny nail put through for bearing. Then two sets of ⅜-inch holes were bored through both uprights and pitman, 1 inch apart and 3¾ inches above the lower ends of the uprights for a piece of ⅜-inch dowel which was used for the pitman pivot. The two sets of holes permitted varying the back-and-forth motion of the sanding block from 1 to 2 inches.

A leather belt was slipped over the pulley and to a motor with 4 speed cone pulley.

Roosevelt's White House Hobbies

(Continued from page 121)

Roosevelt is especially fond of naval postmarks and is constantly on the watch for Civil, Spanish, and World War cancellations of naval character.

In 1918 the President was senior naval representative of the United States in Europe. This work brought him in touch with King George, the acknowledged dean of British philatelists, and the cares and troubles of the war were laid aside while conversation centered on their hobby.

Finds Rare Stamps in Trunk

The President began collecting stamps as a small boy. He said he might have dropped the hobby as he grew older, had it not been for an accidental find in an old trunk in the attic of his home where he discovered a package of letters written by his grandfather, Delano, while in the diplomatic service in China. The dates ranged from 1856 to 1870.

The find was a treasure. It included examples of the first stamps issued by Hongkong.

The President's collection of lithographs is very treasured. Art authorities say that Mr. Roosevelt has some of the finest Currier and Ives lithographs in the United States today. These are quaint prints of ancient nautical scenes and clipper ships—prints that originally sold for not more than 50 cents apiece, but which now command hundreds of dollars each and sometimes a thousand dollars or more. The President was among the first to realize their historical value and started collecting them as a young man.

Hobby Delays Conference

The term lithograph simply means a printing picture originally engraved on a flat stone. Since no photographs are available of the vanished sailing ships of old, colored lithographs are of great historic value and are always in demand.

On more than one occasion Mr. Roosevelt has been late for an appointment because he was lured into a print shop or an auction room seeking these old lithographs. While Governor of New York he once had an engagement with a very important official at four o'clock. Time passed. The official grew restless. Mr. Roosevelt arrived finally at five-fifteen with a couple of prints under his arm. He explained that he had seen some likely items in a print shop window, entered the shop, browsed, talked and lost all track of time. But he had found a print or two that he wanted. Rumor has it that the personage has now taken up collecting himself and is also late to important appointments occasionally.

During the past six months there has been no time for auctions and none for browsing. But even in these busy days the President's personal secretary goes through all auction catalogues and mentions items that may be desirable.

These are the President's hobbies. Although one of the hardest working officials in the country, he finds rest and pleasure with these diversions. Through them all runs the salt tang, the rolling waves, the brisk wind and the adventure of the sea. They are the outgrowth of a thwarted ambition of the boy Roosevelt, who wanted to be a sailor, but instead was sent to Harvard by his father. His avocations have become many and now place him at the head of American hobbyists.

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Guns From All Nations in Movies

(Continued from page 77)

the firing begins. Care must be taken that the actors do not come too close to the guns in the heat of battle or serious burns may result. At the same time the action must not be repressed.

When the scene has been filmed the guns are once more collected and put back into boxes.

Real bullets are seldom fired on the set. Sometimes, however, the action calls for a door to be perforated, say, or bric-a-brac to be smashed. Then an expert marksman is called in to do the shooting. Actors and workers alike are cleared off the set so that there will be no possible chance of anyone being struck.

Convert Weapons to New Types

"Incidentally," says Stembridge, "the arsenal will not deliver 'live' ammunition to a company unless it can show a special order signed by the studio production manager."

In battle scenes where great numbers of rifles are needed, a few, of course, may be dummy guns, unequipped to shoot even blanks. Nevertheless, they will be fashioned with extreme care to match the period in which the story action takes place.

On the other hand, "fireable" weapons are sometimes converted from one type of gun to another—as for instance, a cartridge rifle to the old muzzle-loader of our fore-fathers.

A recent order of this kind, Stembridge said, called for more blunderbusses than the arsenal had on hand. They were to emit smoke exactly as the ancient weapons did, both from the end of the barrel and from the firing pan.

Get Guns From Germany

Devising the bell-mouth was fairly easy; a small brass auto horn properly shaped and wired on every gun successfully achieved the effect. The firing end of the gun was more difficult. Here's the way it was done: A small flash pan was fastened near the trigger. A hole in the breech allowed sparks from the exploding cartridge to ignite powder in the pan, giving a wisp of smoke.

It is seldom necessary to "fake" the wanted type of gun, since genuine firearms of every make, period and country are stored in the vault-like rooms of movie arsenals.

Of course, in huge war spectacles, where large numbers of troops are used, the resources of the movie gun-rooms "play out" and the studios have to go outside for additional firearms.

Universal's "All Quiet On the Western Front," for example, not only exhausted the arsenal's stock, but utilized $30,000 worth of arms equipment bought in Germany especially for the picture. In addition, large numbers of guns were borrowed from American Legion Posts around Southern California. Every type of weapon, from giant howitzers to German automatic pistols, played their part in that great production.

During the vogue of gangster pictures, machine guns were used on nearly every stage, Stembridge says. And, of course, the ever-faithful Western always has plenty of gunplay.

Today, with war and adventure films popular, the use of firearms by the movie studios is probably even more general. Yet, because of the extreme care exercised in handling firearms and ammunition, no gun accident has ever occurred.

Byrd Broadcasting From South Pole

(Continued from page 49)

About 800 miles from Little America, near the South Pole itself, two men will live in a hut buried in snow to study weather conditions. It will be the nearest base human beings have attempted to maintain at either pole. During four months of polar darkness, their only means of communication with the rest of the expedition will be by radio.

And communicating with these stations and with the outside world, if possible, will be the 100 watt short wave radiophone on Byrd's giant Condor.

While the ice breaker, "Bear" of Oakland, re-establishes Byrd's old base at Little America, the "Jacob Ruppert" will carry the admiral to the Weddell Sea, 1,500 miles south of Cape Horn. On the ice barrier there the giant Condor, equipped with skis, will be unloaded, fuelled, and heavily provisioned.

Plans Longest Polar Flight

With Pilots June and Commander C. O. Noville, Admiral Byrd will bid farewell to the "Ruppert" and take off on one of the longest polar flights ever attempted. From the Weddell Sea the trio will fly across frozen wastes never seen by man to the South Pole and then to Little America, a distance of approximately 2,500 miles.

On this flight Byrd will attempt to talk over the Columbia Broadcasting Company's network either directly or through the station at Little America, which now on the "Jacob Ruppert" has the call letters KJTY. That broadcast will bring to millions the roar of the motors in the 75 below zero air above the Pole.

To breach the 10,000 miles from Little America to New York Columbia has arranged for a reception outpost at Buenos Aires, 4,000 miles from the Antarctic station. The Buenos Aires station will rebroadcast the South Pole programs to assure good reception in the United States.

To Use 66 Radio Channels

In charge of the broadcasting at Little America will be John N. Dyer, Columbia Broadcasting system engineer, and Charles J. V. Murphy, production man, who will also act as announcer.

Dyer, 23, one of the youngest members of the expedition, is an expert in short wave transmission, especially directional work. A directional antenna will be used at Little America. This will increase the signal volume of the station in one direction about twenty times.

Murphy, newspaperman and former sports announcer in Boston, will have the job of arranging the weekly programs during the expedition's two years in Antarctica.

The Federal Radio Commission has assigned Byrd's main station fifteen wave lengths for voice transmission and fifty-one channels for code signals.

The broadcasts will not be confined to the regular weekly programs. Should a feat of exploration occur or tragedy take place, Little America will immediately get in touch with the Columbia Broadcasting System in New York and the network will be tuned in through the basic station WABC in New York City.

(Continued on page 133)

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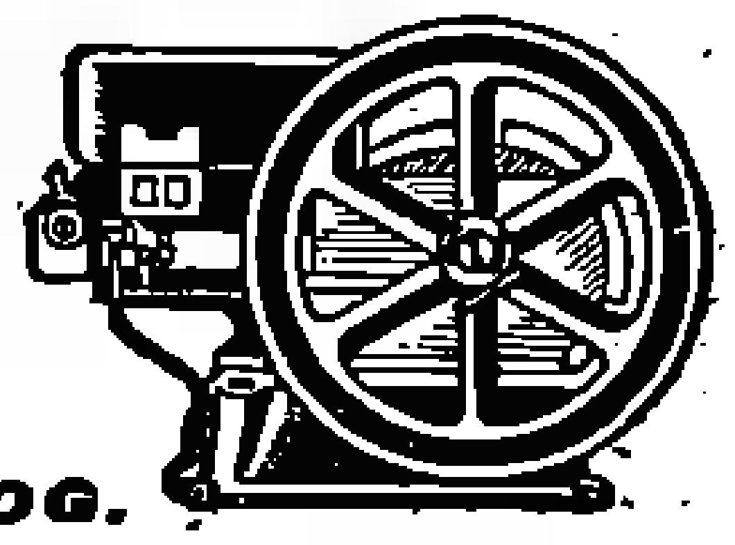

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Daylight Developing Tank

(Continued from page 109)

about ¼" on the bottom and ⅛" on each side to be bent over to form rabbets to hold the negative. Do not have the negative fit the sheath too snugly or it will bind after the asphalt coating has been applied. Bend up a portion of the bottom margin to form a support for the negative and also to permit the free circulation of the solutions. A V-shaped finger slot is also cut in the top of the sheath.

The proper location of the channels which support the racks can now be determined and when these are soldered in place the remainder of the inside of the tank is ready to receive its protective coating.

Cover of the tank is made from two 5/16" boards with a sheet of rubber cut from an old inner tube glued between them, the whole held together with screws driven from the inside. The lower board should fit snugly inside the rim of the tank, and the upper board, together with the sheet rubber, should extend about 5/16" all around. Coat the lower board the same as the inside of the tank.

Operation of the Tank

The construction and manner of attaching the cover clamps is shown in the photo. Any desired pressure may be obtained by simply adjusting the nut. Pulling down on the threaded end of the bolt engages the nut with the wire, resulting in a water-tight seal between the rubber and the edge of the tank.

The outside of the tank and cover may be finished as desired; two coats of aluminum bronze giving it a neat and attractive appearance.

In operation the one-tank method is simple, yet exact, and produces negatives of uniform quality. Load the negatives into the tank in total darkness or with a suitable safelight. Take out into the light and pour in the correct amount of developer to entirely cover the negative. Fill the tank at a single pouring or development will be uneven. For the same reason turn the tank on its side or top several times during development.

Negative Stays Until Dry

When the specified time has nearly elapsed, drain out the developer and fill with clean water. Shake this around a few times, drain, and pour in the fixing solution. When the negative has been thoroughly fixed, drain out this solution and run in at least six or eight successive fillings of water to wash the negatives.

This method of development eliminates any chance of the negatives receiving scratches or fingerprints due to careless handling as it is unnecessary to touch the negative from the time it is loaded into the tank until it is entirely dry.

If the negative is on glass it may remain in the sheath until dry, if on film clip [redacted] spring clothespin onto the upper margin and hang up to dry.

To travelers, especially, will the simplicity and compactness of this system make its appeal. Developer and hypo in tablet or powder can be used and stored, when not in use, within the tank itself. It will be found an easy matter to develop the negatives of each locality before leaving it, thus serving as a constant guide to correct exposure.

Expert Tips on Winter Ice Fishing

(Continued from page 72)

run, the line is released from the notch and slowly unwinds. Line wound on a stick as shown in the same drawing, will likewise unwind and perform equally as well. The idea is to slow up the fish and wear it out.

In jigging for fish, particularly pickerel or great northern pike, obtain any manner of ordinary wobbling spoon in a medium size, let it down in the water and by a steady jerking up and down you will attract the fish to strike. The wobbling spoon, that darts from side to side when thus operated up and down, is the best.

Stops Line From Tangling

In jigging for pickerel, pike or lake trout (the latter best fishing in February), particularly where fish ranging up to twenty or more pounds in weight may be met with, lay your line out for some distance back of you on the ice so that when a fish is hooked your line will not get tangled.

Much depends upon how you make the hole in the ice whether you can land the fish once you have hooked it. Accompanying illustrations show the right and wrong way of making this hole. With the hole large at the top and tapering narrow to the bottom, the line is likely to be fouled on the ice and there will be a world of difficulty met with in handling your catch.

Here are a few kinks. You can pick minnows out of the minnow bucket with a small two-inch wide coffee strainer, instead of dipping the hands in the cold water. A three or four inch round strainer can be used to advantage in skimming the slush ice after you have cut the hole.

Salt Adds Pep to Minnows

Mud-minnows make the best winter-fishing minnows. They are very hardy. Chubs and shiners taken from flowing water demand well aerated water. A little salt in the water adds pep to the minnows. Protect the minnow bucket from freezing by wrapping it about with a blanket.

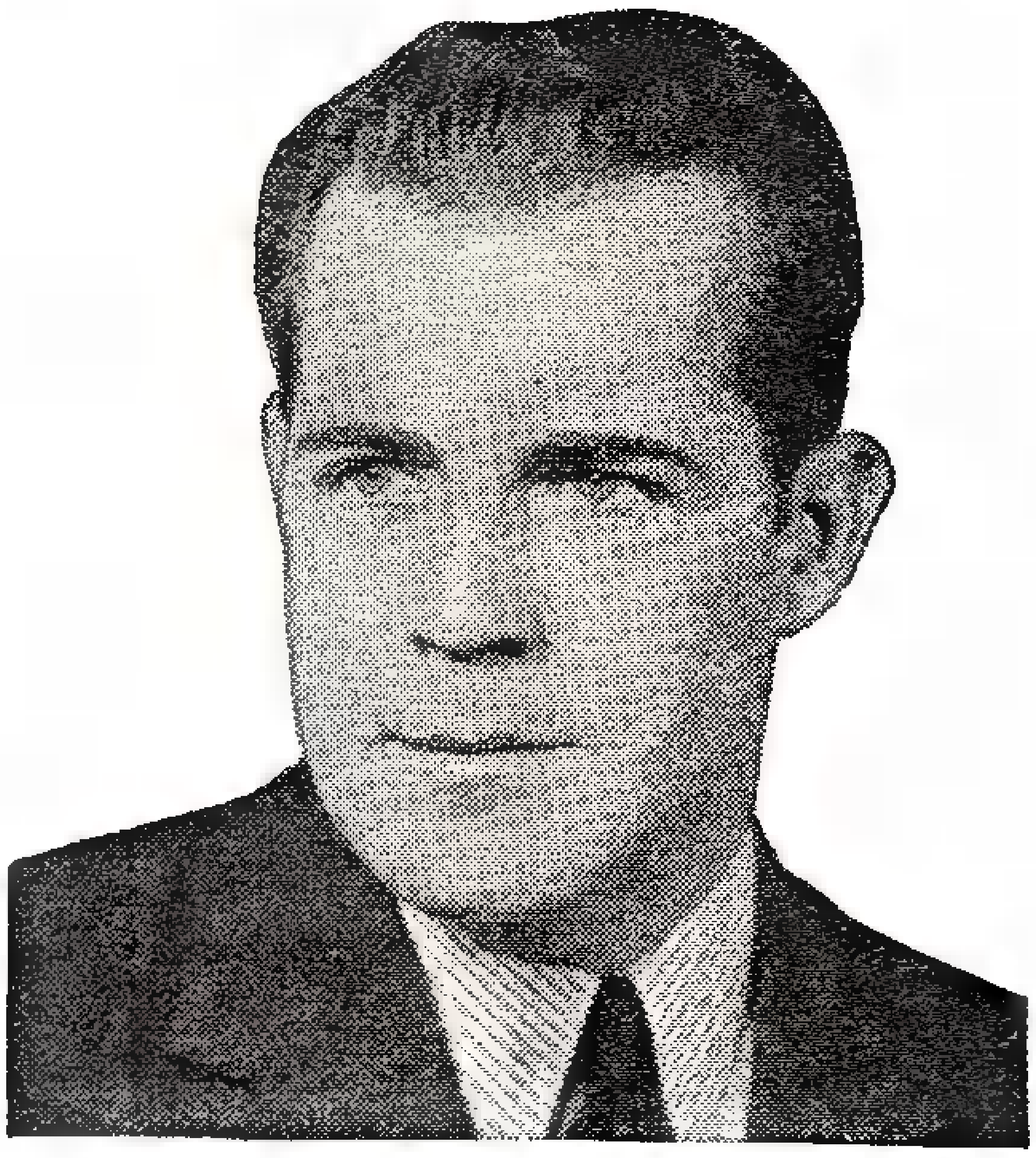
A large glass jar or a small box with galvanized mesh containing minnows may be let down in the water to the level of the fish. The fish will be attracted, attempting to get at the minnows in the bottle or the box. Fish around them and you are sure to have success.

A small gold spinner, size 2, on a shaft ahead of your minnow often adds twice as many fish to your string. A fine mist-hued gut leader of six feet in length practically makes the connection with the hook invisible. This will help you get fish, especially in waters where the fish are "educated" up to the wiles and methods of the fishermen. The leader should be made limp by putting it in lukewarm water, and keeping it between moist pads till you use it.

Wall-eyed pike and crappies are two winter fish that can be caught at night. Like the owl they are nocturnal, and see in the dark.

Fish for pike and pickerel off of the mouth of streams coming into lakes. Fish off of points of land, and between islands and the mainland, if the passage is narrow. Set lines are best employed at such places.

In cold weather the fish go deep and lie idle. In mild weather they move out on feeding runs and are often found in more shallow water.



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A famous scientist and Kidney Specialist recently said: "60 per cent of men and women past 35, and many far younger, suffer from poorly functioning Kidneys, and this is often the real cause of feeling tired, run-down, nervous, getting up nights, Rheumatic pains and other troubles."

If poor Kidney and Bladder functions cause you to suffer from any symptoms such as Loss of Vitality, Getting Up Nights, Backache, Leg Pains, Nervousness, Lumbago, Stiffness, Neuralgia or Rheumatic Pains, Dizziness, Dark Circles Under Eyes, Headaches, Frequent Colds, Burning, Smarting or Itching Acidity, you can't afford to waste a minute. You should start testing the Doctor's Prescription called Cystex (pronounced Siss-tex) at once.

Cystex is probably the most reliable and unfailingly successful prescription for poor Kidney and Bladder functions. It starts work in 15 minutes, but does not contain any dopes, narcotics or habit-forming drugs. It is a gentle aid to the Kidneys in their work of cleaning out acids and poisonous waste matter, and soothes and tones raw, sore, irritated bladder and urinary membranes.

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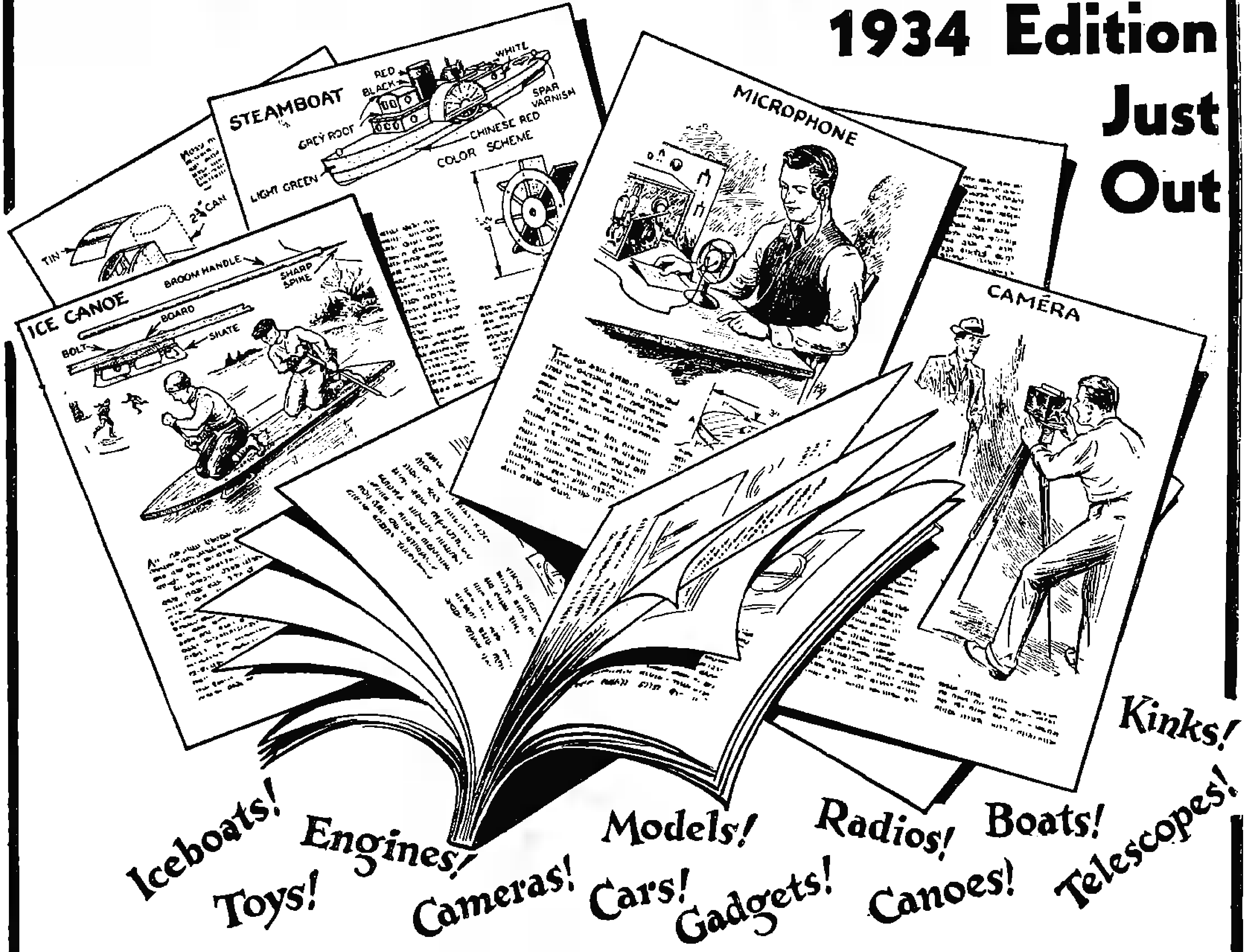
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Byrd Broadcasting From South Pole

(Continued from page 129)

By means of radio the 60 scientists and adventurers at Little America will be able to hear from and communicate with relatives during the great adventure in the South Polar regions. Radio, too, will carry to the Antarctic encampment of huts advice of medical experts of the United States, if necessary.

The purpose of the second expedition is to map and claim any areas of ice recession about the Pole, to determine natural resources that might be utilized by man, to gather data on weather conditions and radio disturbances, and to discover if the ice barrier represents a waning Ice Age or the beginning of a new one.

Byrd will also attempt to fly to the South Magnetic Pole, 1,000 miles from Little America, for photographs and other scientific data. With tractors and snowmobiles, as well as sledge dogs, he will establish bases in the territory explored.

To feed his dogs alone Byrd is carrying 50 tons of food to Little America. Fifty sleds and 150 sets of harness are also part of the equipment.

Dr. Guy O. Shirey, chief medical officer of the expedition, superintended the selection of food for the men. It includes dehydrated vegetables, Pemmican, a concentrated fat and meat food, Erbswurst, consisting of pea meal and bacon, Bovril, a concentrated beef beverage, and two ounces of Vitamin C fluid to replace the hundreds of bushels of fruit that would be required for the entire expedition.

Even philately is among the varied interests of the expedition. The first South Pole United States postoffice was established when John Oliver Lagorce, vice-president of the National Geographic society, was sworn in as postmaster.

Lagorce described his office as 9,810 miles south of Washington and of an "underground igloo nature." Approximately 50,000 pieces of mail were carried to Little America, President Roosevelt himself asking Admiral Byrd to send a letter for his famous stamp collection.

The expedition supported by 1,400 backers has 14,000 separate pieces of scientific equipment, valued at $100,000.

From this great exploration expedition at the bottom of the earth will come the thrills of adventure as Little America takes the air.

The Magic Palace of Radio City

(Continued from page 41)

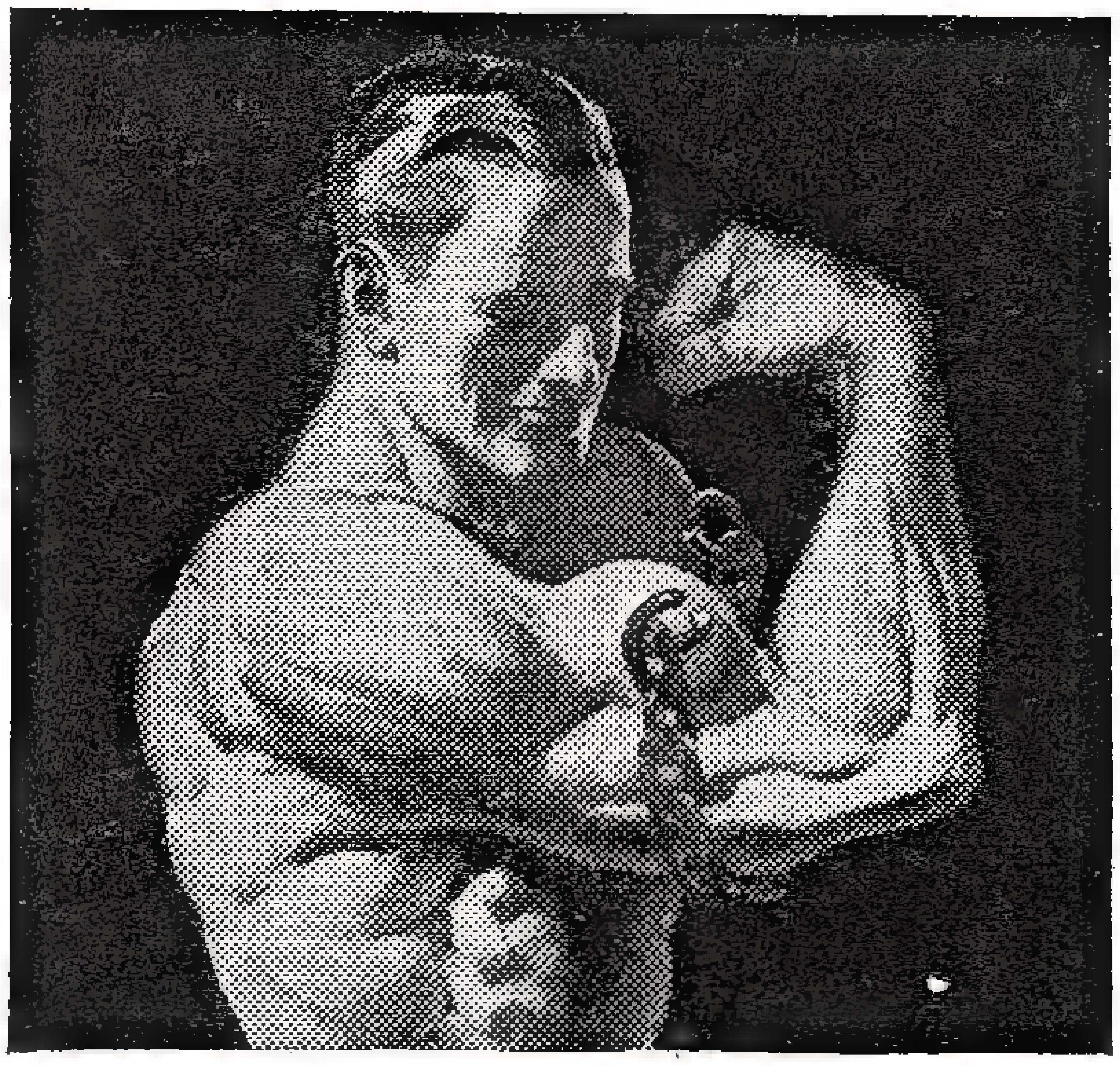
of Freeport, Ill., Vicksburg, Miss., Jackson, Tenn., or Boise, Idaho. All buildings connected with the enterprise are biggest. All studios are biggest. There is the greatest number of biggest things one can possibly imagine.

The central auditorium or broadcasting studio, where the dedicating tycoons and guests met, is 75 by 132 feet, and has stages which are reversible.

Any brief description of Radio City must of necessity be a statistical parade. This "City" is the western part of the Rockefeller center which occupies three square city blocks, so valuable that the yearly rental is $3,000,000 for land alone.

The central tower, or RCA building in which is housed NBC's new headquarters, dominates the whole community. It is 70 stories high, rising 836 feet in the air.

MOULDING A MIGHTY ARM



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Send 25c for this course today. Why not start now to build a he-man's arm?

You can't make a mistake. The assurance of the strongest armed man in the world stands behind this course. I give you the secrets of strength illustrated and explained as you like them. Mail your order now while you can still get this course for only 25c.

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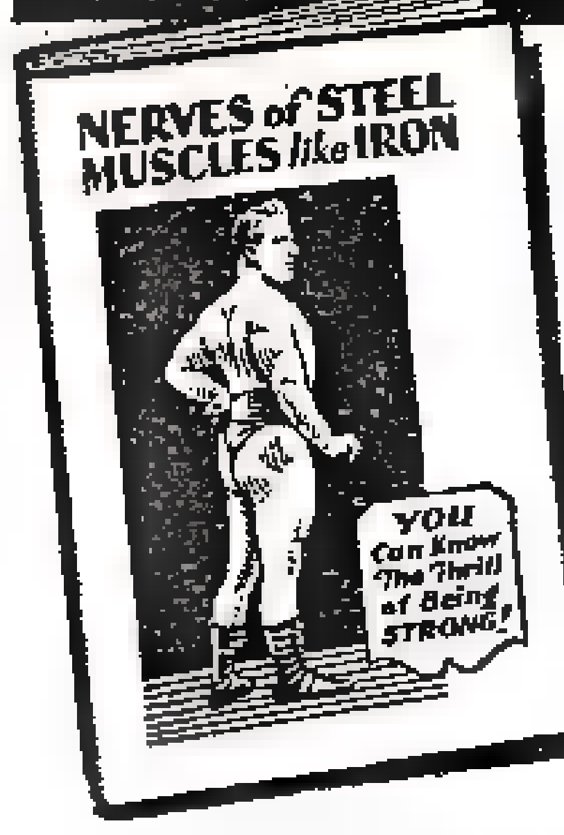
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29x4.75-20	2.50	0.95
29x5.00-19	2.85	1.05
30x5.00-20	2.85	1.05
28x5.25-18	2.90	1.15
29x5.25-19	2.95	1.15
30x5.25-20	2.95	1.15
31x5.25-21	3.25	1.15
28x5.50-18	3.35	1.15
29x5.50-19	3.35	1.15
30x6.00-18	3.40	1.15
31x6.00-19	3.40	1.15
32x6.00-20	3.45	1.25
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31x4	2.95	0.85
32x4	2.95	0.85
33x4	2.95	0.85
32x4½	3.35	1.15
33x4½	3.45	1.15
34x4½	3.45	1.15
30x5	3.65	1.3[illegible]
33x5	3.75	1.45

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Seth Parker Sails for World Cruise

(Continued from page 37)

jammer on a voyage of adventure around the world. Over the bounding main he has gone seeking undersea monsters, sunken treasure and fierce jungle animals.

With him went the Jonesport, Me., of radio fame. Ma and Seth Parker took with them their entire cast of Sunday evening entertainers so radio listeners of the National Broadcasting company might not miss the regular weekly get-together of Jonesport folks.

Lord, who is 33, was born in Meriden, Connecticut, of humble parents and from the start got an inside into plain, rustic New England life.

Rural Sketch Brings Fame

After graduating from Bowdoin College, he tried business, school teaching, and writing and was not successful. He worked in a candy factory to keep his family from starvation.

Then one day he heard a radio broadcast that was a take-off on rural life. He recalled Sunday hymn meetings in the home of his father, the Rev. Albert J. Lord, and set out to write a radio sketch of his boyhood memories in Connecticut and Maine.

A radio station in Hartford, Conn., tried it. It was a great success and soon the National Broadcasting company took over "Sunday Evening at Seth Parker's."

Seth Parker became famous. The commercial fruits which accompanied that popularity put Phillips Lord in the Easy Street class. He was able to carry out his school day dream.

The **Seth Parker** expedition set out early last December, bent not only on facing the horrors of the seven seas, but also prepared for invasions of the jungles and for adventure undersea.

Seeks Animals for Museum

Besides carrying an elaborate radio set-up, the schooner was equipped with complete hunting regalia for bringing back alive some of Africa's prize animal catches.

Special diving bells were to be used for the capture of sea monsters. They hope to catch those monsters which have existed more in sea myths and which have never actually been brought back. They are determined to check up on these legends. If the sea-beasts do actually exist, they'll be brought back for the Field Museum in Chicago.

The **Seth Parker** map also has points where treasure ships are sunk. Lord and his men will attempt to retrieve as much as this trove from the bottom of the ocean as they possibly can. Expert divers have been taken on the journey for this special service. This part of the trip is all a dark secret.

During the eighteen months that the Lord expedition is spending in girdling the globe, the Sunday night programs are not being interrupted. The Jonesport, Maine, folks will send their entertaining Yankee programs by short-wave to Buenos Aires, Singapore, Honolulu, Rome or London from which cities the broadcast will be relayed to New York for the NBC chain.

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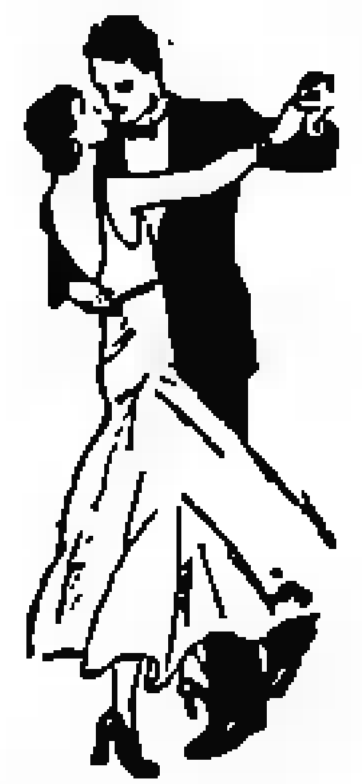
SECRETS of Beautiful Dancing



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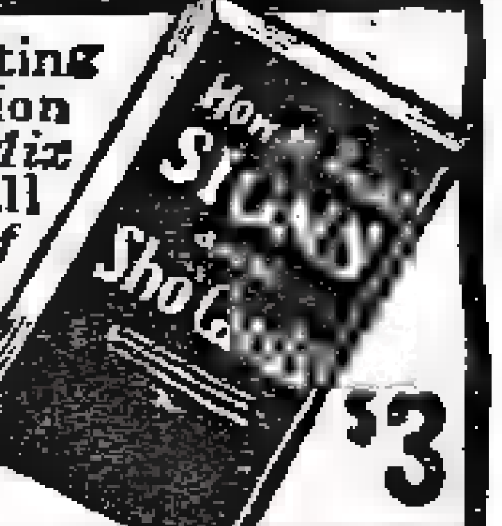

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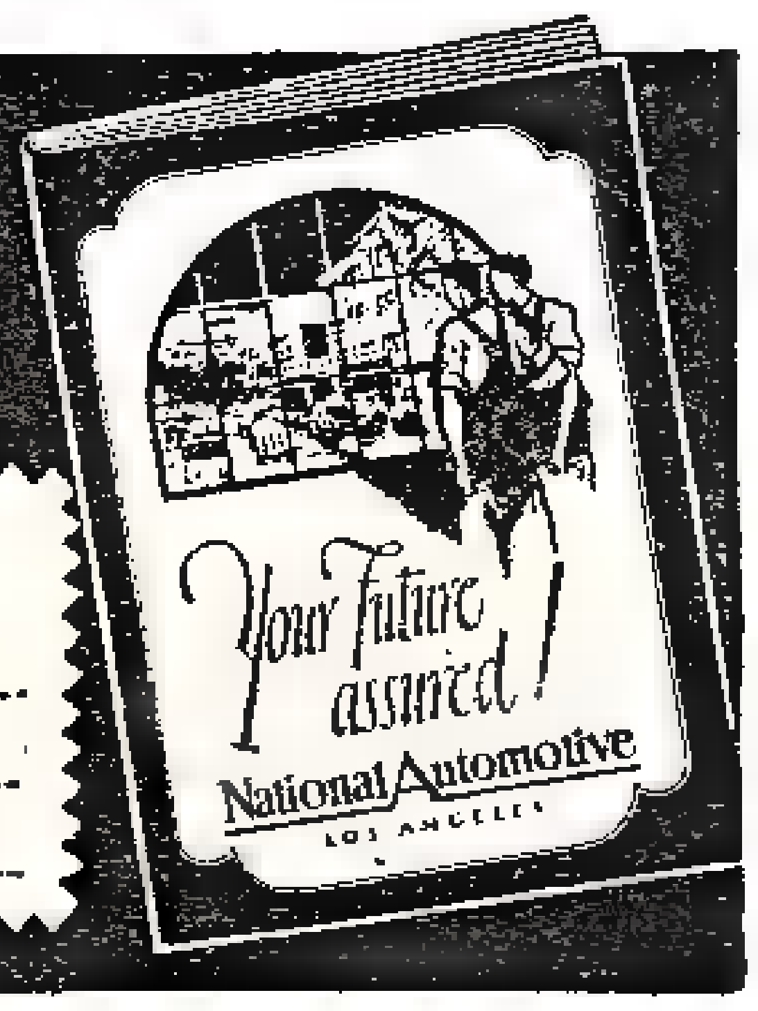

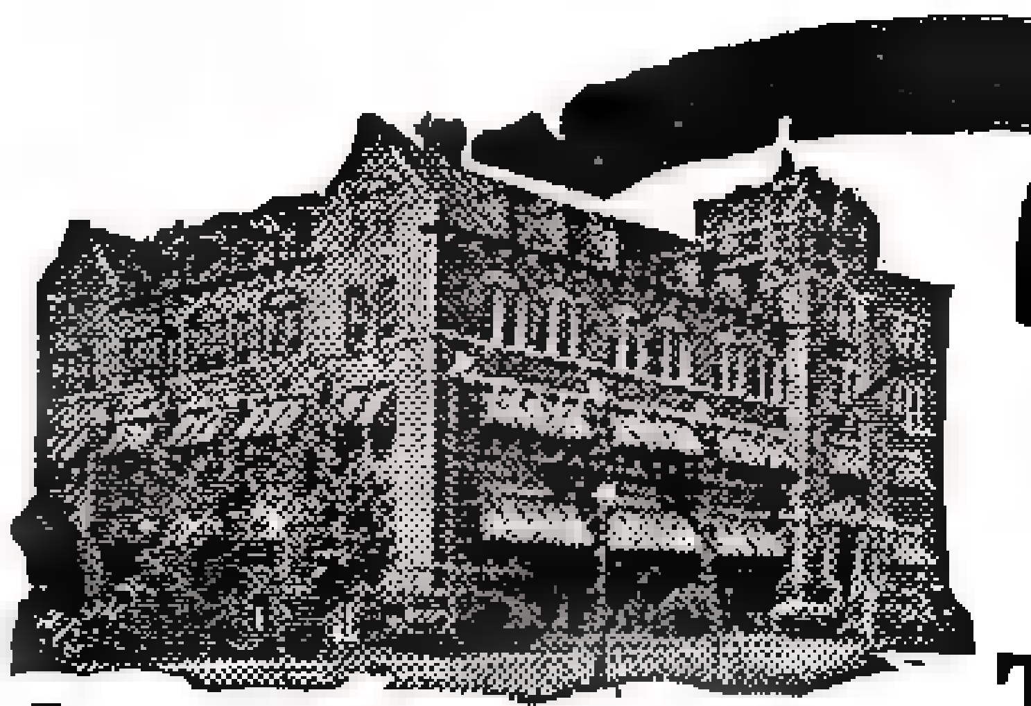

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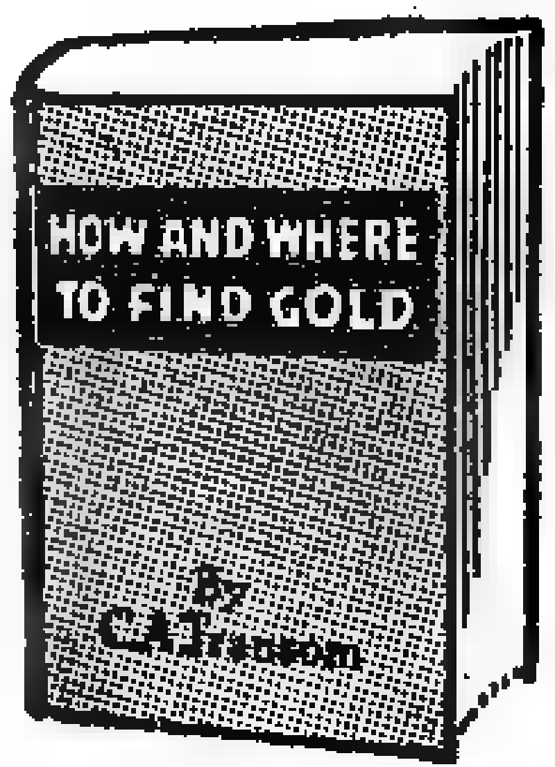

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Wedell, Air's Cowboy Speed King

(Continued from page 58)

He soon bought the motorcycle. He became the fastest moving person in Texas, but discovered there was a faster vehicle in the air. Jimmy learned to fly, won prize money in motorcycle races and bought a biplane.

Teaming With Williams

Barnstorming one day he landed at Patterson, La., and met Harry Williams, son of Louisiana's sulphur magnate. He told Williams all about the future of passenger flying business. Williams became interested and offered to go into partnership with Jimmy.

Soon they had an air field, shop, and a dozen planes at Bayou Teche. The partnership grew into a full-fledged air line, the Wedell-Williams Air Service, with planes flying regular schedules to New Orleans, Houston, San Antonio, and Laredo.

Some persons might have been content with such achievement, but not Jimmy Wedell. He had other ambitions. He knew ships and motors and he figured they ought to go faster.

So again he confided in Williams. He wanted to build really fast planes. So he went to work in the shop and stayed there literally night and day, taking trips but occasionally. He worked steadily for months.

Soon a new ship with a new motor, built according to Jimmy's own ideas, took form in the shop. Streamlining, the principle used in automobile building after air engineers had shown the way, was called in in its highest form. For the first time even landing wheels were streamlined.

The great day came when the craft was pushed out of the shop. Jimmy strapped on a parachute. He started the "works" at only 800 feet.

Then disaster. A wing crumpled and fell off. Jimmy jumped in a parachute. His plane was wrecked, but he knew how to design fast planes.

In five years his experiments brought results. Capt. James Haizlip won the Bendix trans-continental dash, Mrs. Haizlip then won the women's world speed record and Col. Roscoe Turner captured another cross-country dash with Wedell ships.

Jimmy then broke Jimmy Doolittle's Ottawa to Mexico City record by flying 250 miles an hour, a total of 12 hours, 36 minutes.

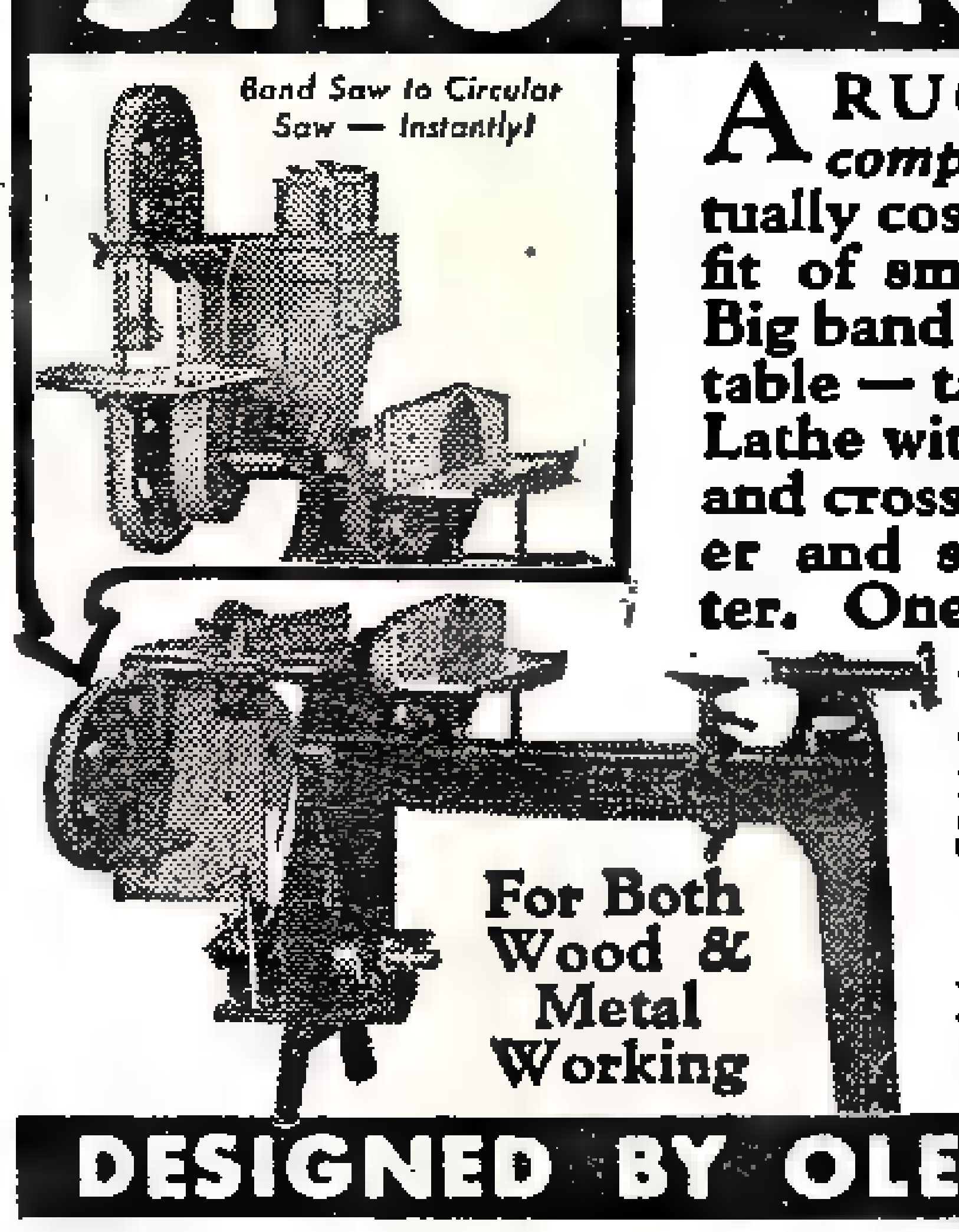
World's Mark

Meanwhile Doolittle set a world's mark for speed in a land plane, 294.36 miles an hour. Wedell decided to beat that. He tinkered with his "No. 44," low winged, red and black streamlined monoplane. He put in a Pratt and Whitney Wasp Sr., 800 h.p., 1,344 cu. in. displacement, super charged motor, 2,400 revolutions per minute. He used a Hamilton two bladed, controllable pitch propeller.

He flew to Chicago for the National Air Races. No. 44 roared into the air. Four laps. Stop watches clicked: 316 miles per hour; 299 m.p.h., 311 and then 294, an average of 305.33 miles an hour—the world's record.

Jimmy Wedell, the Texas cowboy, was the speed king of the air!

SHOP-KING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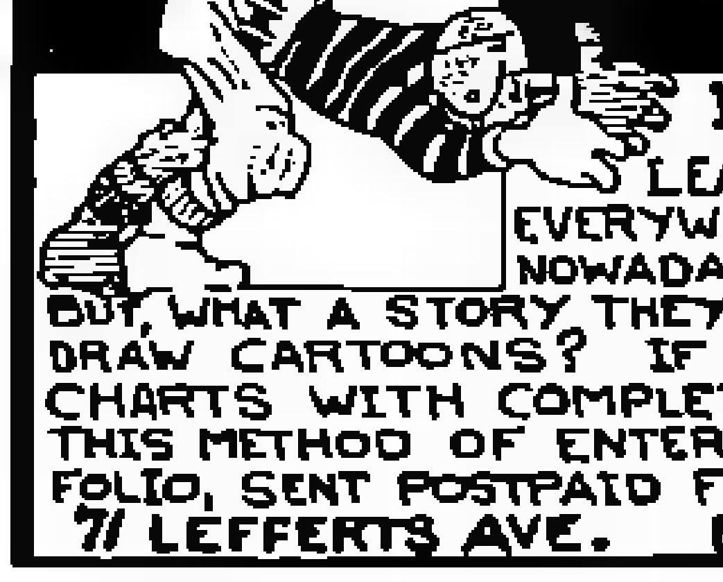

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ENGINEER DOBE. 1951 Lawrence Avenue Div. 22, Chicago

Floating Airports to Link Continents

(Continued from page 61)

from the surface to the underdeck hangars. This specially-designed elevator will adequately handle planes with wing spans up to 120 feet.

This flying deck will be supported in place by a number of ballast tanks sunk sufficiently below the water so that the flotation arrangement will be unaffected. That was the inventor's predominant problem, constructing his float so that it would not shift and toss with the huge waves.

A truss system of anchorage will hold the big deck by means of cables to a 1,500-ton weight on the bottom of the ocean. The truss-like arrangement will consist of twenty-eight buoyancy tanks floating far beneath the ocean's surface. In turn these will be linked to the deck by means of cast iron columns streamlined into an oval shape above the mean level of the waves and circular below.

Columns 300 Feet Deep

Underneath the buoyancy tanks these columns will continue downward a hundred feet to the ballast chambers which will be stabilized by iron ore. The complete column, including the ballast sections, will be over 300 feet in depth.

Mr. Armstrong has taken advantage of a well-known principle in the construction of his ocean island. Ocean waves are surface disturbances only, while water in the depths is still.

"A model of the proposed seadrome was constructed and tested together with a model of the steamship Majestic, built to the same scale," Mr. Armstrong said.

"Under test conditions it was found that the seadrome was unaffected by any combination of waves up to and including those equivalent to 180 feet in height. The model of the Majestic on the contrary was practically swamped in waves exceeding 80 feet in height."

The engineers of the Seadrome Ocean Dock Corporation associated with Mr. Armstrong estimate that 125,000 tons of iron and steel will be required to erect five airports and anchorages.

30 Hours New York to London

The seadromes will have radio stations and radio beams to guide the air-liners in inclement weather.

Attached to each seadrome there will also be sea-going cutters of the Coast Guard type for emergency as well as auxiliary duty. The floating decks will have weather stations.

At the present time the quarter section of a seadrome is being constructed behind the Delaware Breakwater. When it is finished early next summer it will be towed out to sea for the tests. If it comes up to the expectations of its sponsors, the three other sections will be built and the entire seadrome assembled. In turn work will then be started on the rest of the ocean airports.

Mr. Armstrong estimates that a 24-hour service can be maintained on the Atlantic Ocean, but he further modifies that calculation in plotting the trip between New York and London. He intends to make that journey a 30-hour trip in eight jumps of 160 miles per hour.

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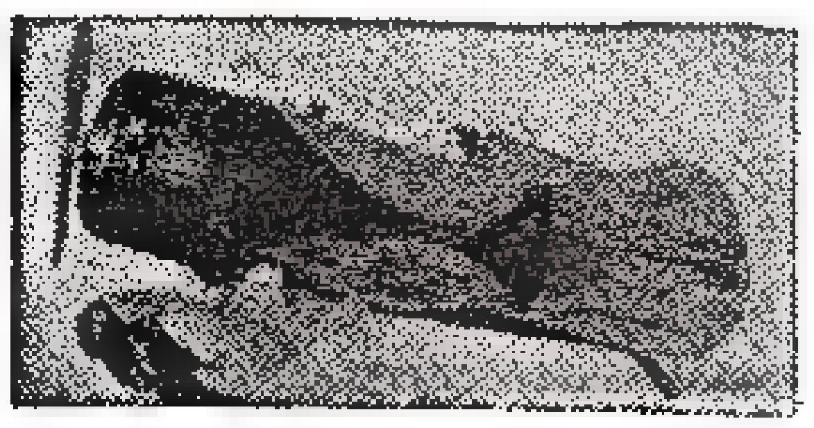

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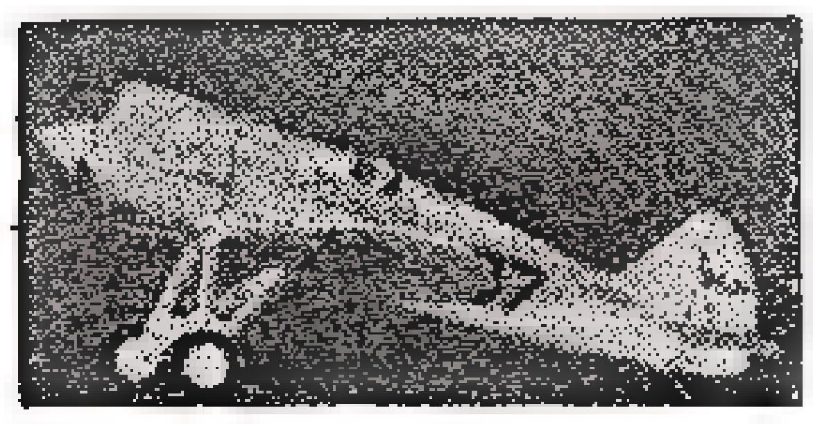

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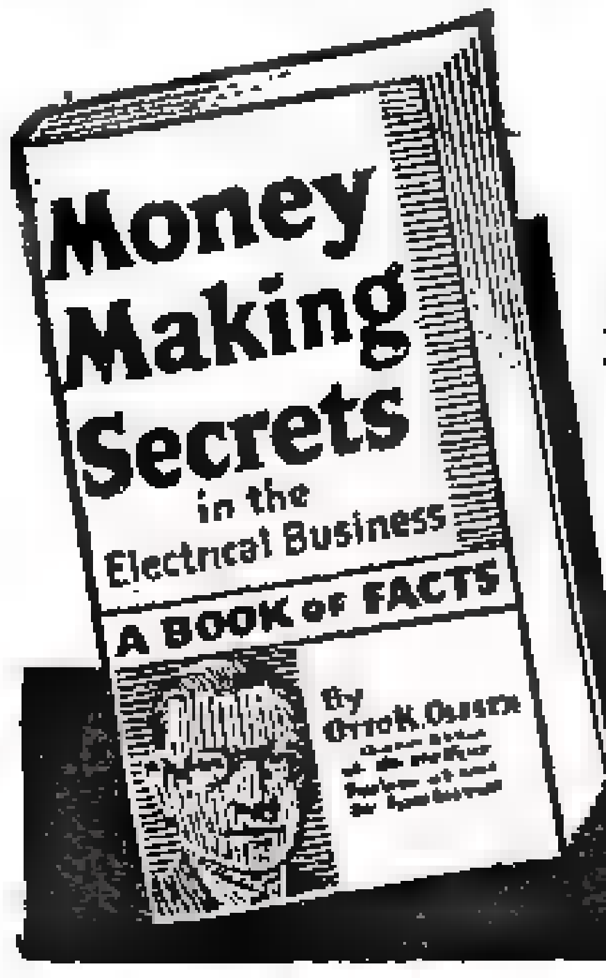

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29x5.25-19	2.95	1.15
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31x5.25-21	3.25	1.15
28x5.50-18	3.35	1.15
29x5.50-19	3.35	1.15
30x6.00-18	3.40	1.15
31x6.00-19	3.40	1.15
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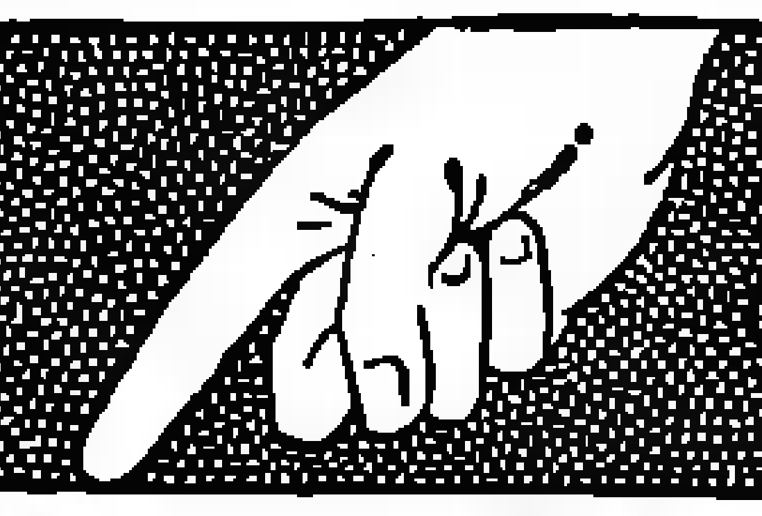

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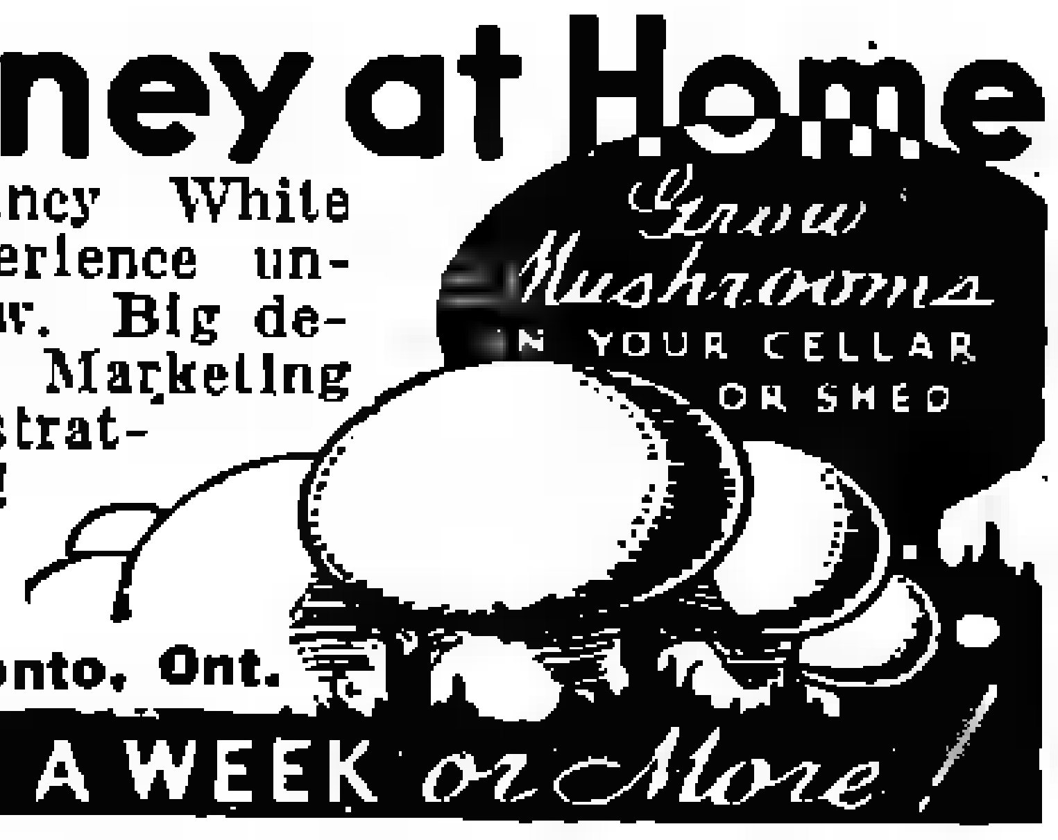

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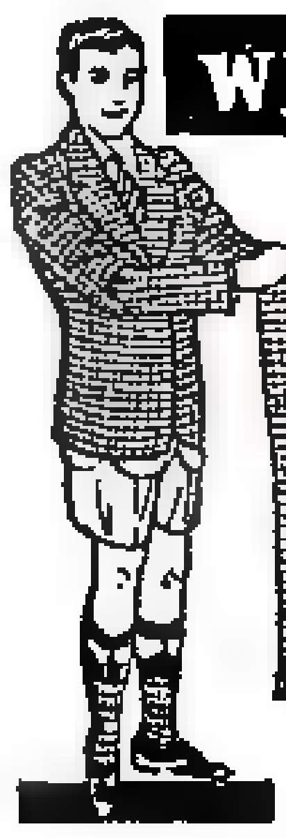

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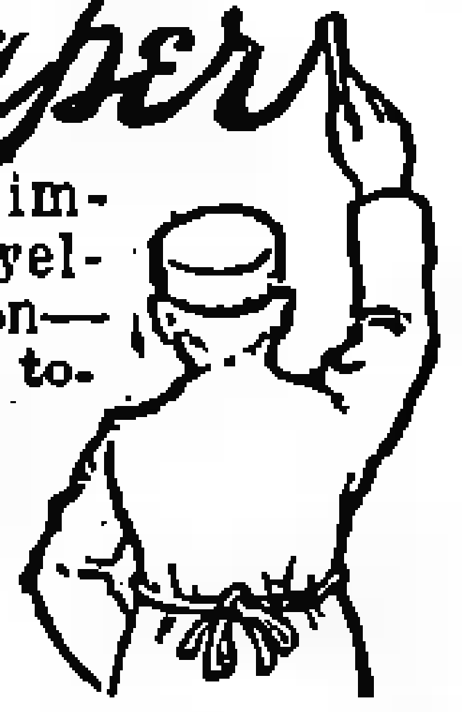

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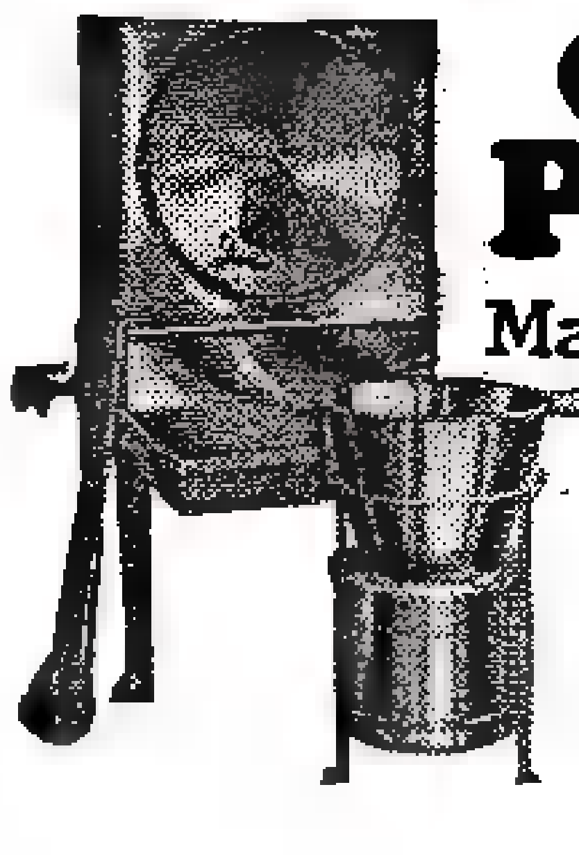

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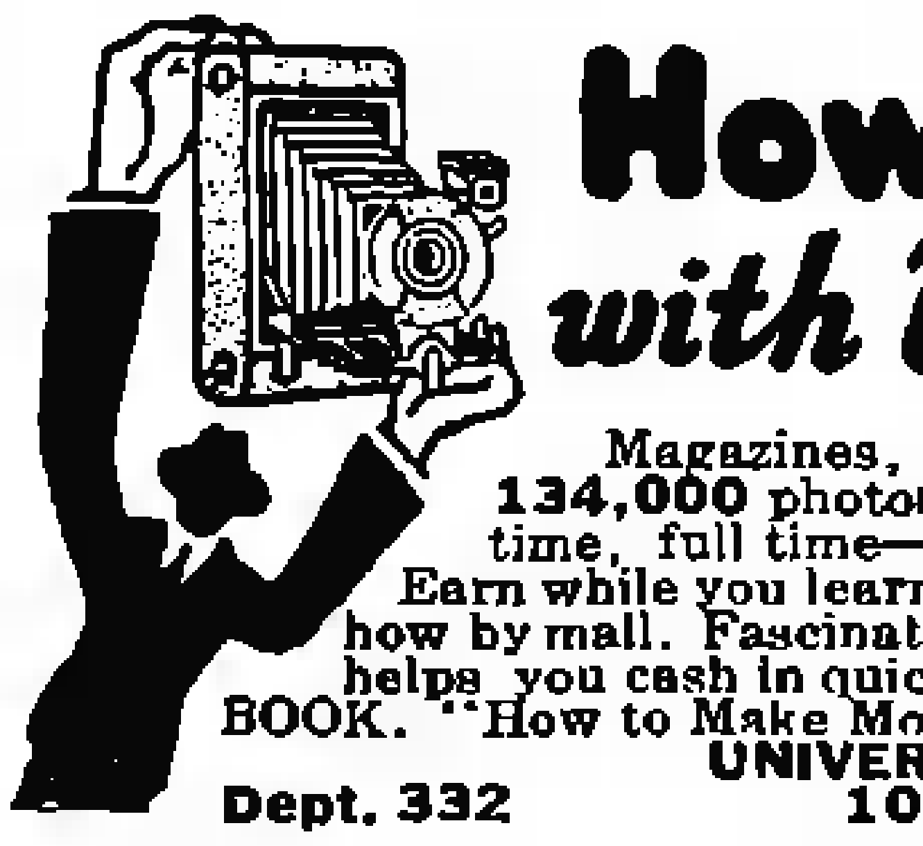

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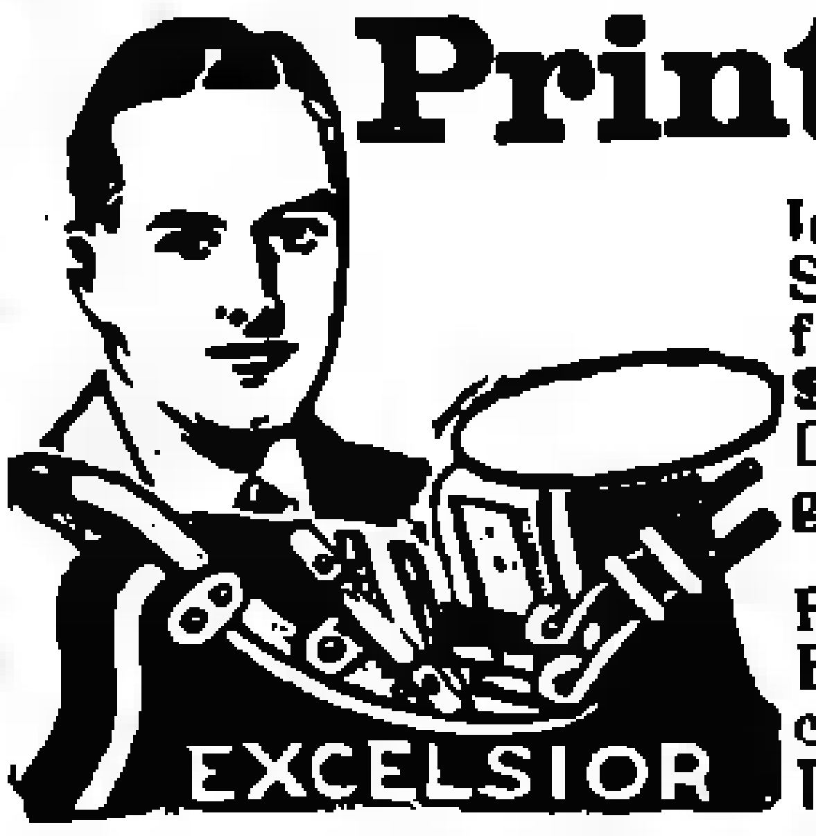

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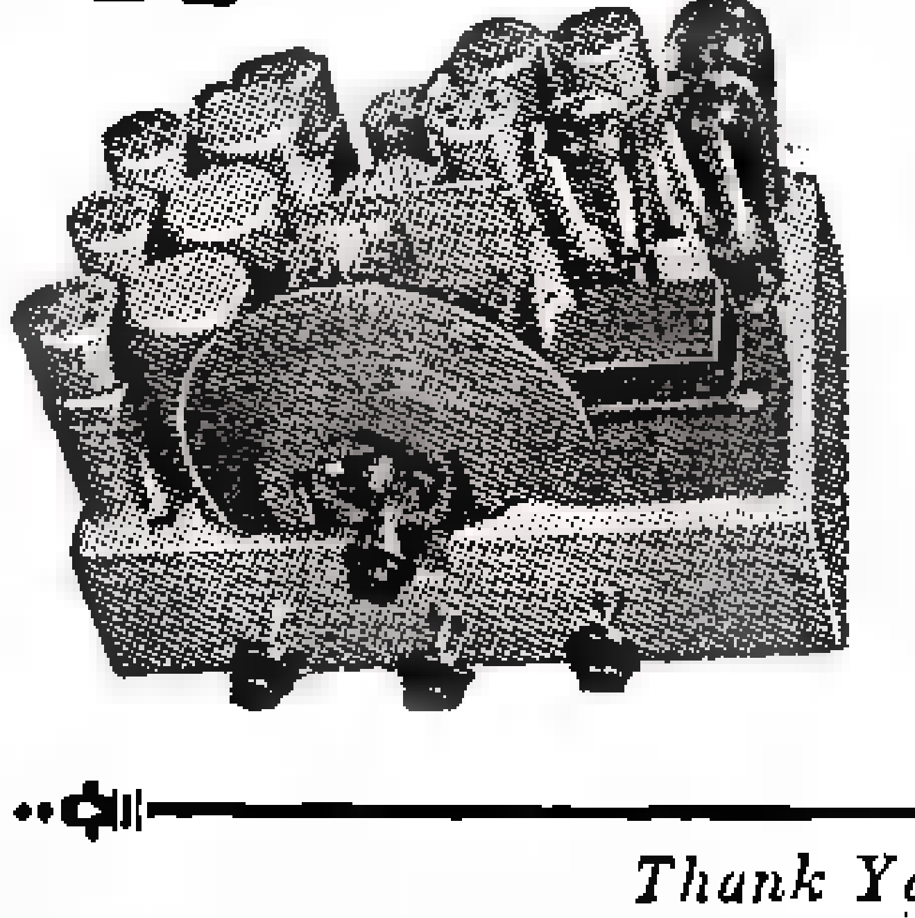

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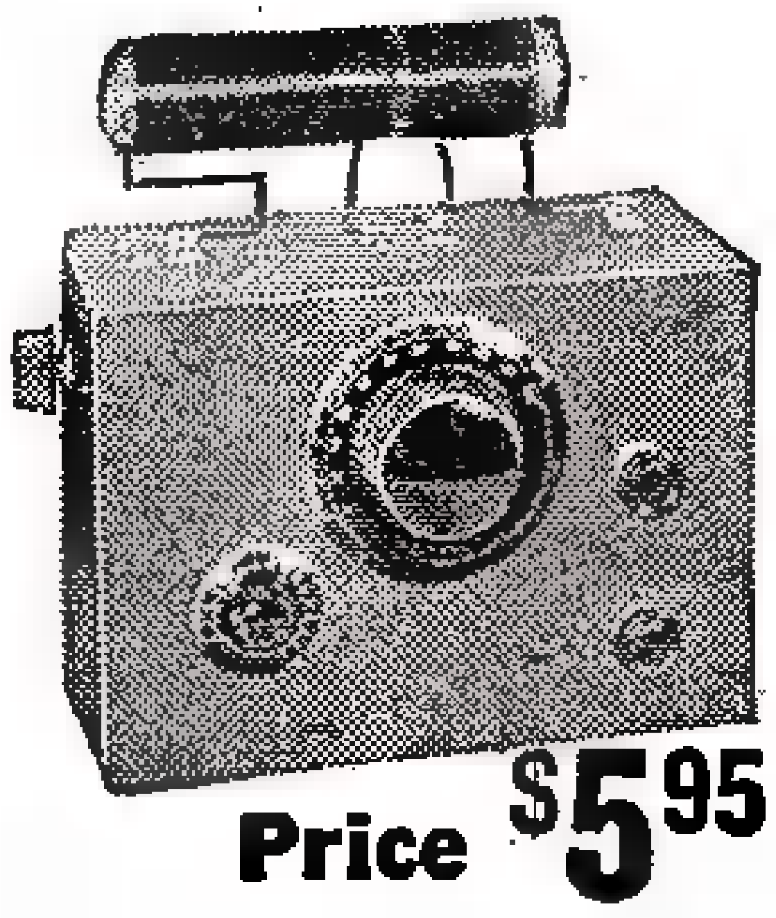

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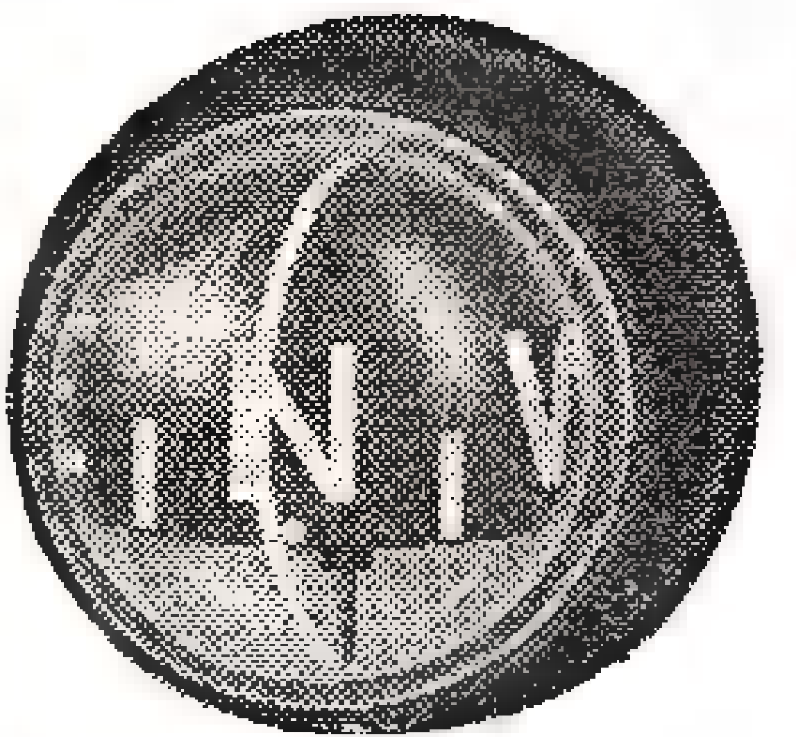

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Fortunes in Needed Inventions

(Continued from page 86)

needed is a foolproof, slip-proof method of holding stair treads in place. If the means for doing this thing can be sold in the five and ten stores so much the better. It should be borne in mind when working on this problem that the method used must not in any way mar the stairs or make necessary the boring of holes.

Rack to Open Paper Bags

Here is an invention which, if it were perfected, would be a success almost overnight for the simple reason that the health departments in all large American cities would practically insist upon it. Store keepers, to open new paper bags either thrust their hands into them or else blow into them. Into these bags go the foods you eat. Why not a bag rack to hold these bags that would be so constructed that every time a bag was removed, it would be forced to open in such a manner that it would be instantly available for filling. The device used could cost as high as five dollars and there is a market for about 300,000 of them. A total royalty of $200,000 should not be difficult to obtain in ten years.

Device for Rubbers or Overshoes

There is needed either a method of manufacturing rubbers or overshoes so that they will not have a tendency to slip off at the heels. Or perhaps a little device of some sort that can be sold from cards in shoe stores and that may be slipped into a rubber and that will prevent its easily slipping off could be made. Naturally this device cannot in any way damage the shoe and it should also make it possible for the rubber to be removed without difficulty.

Pressed Metal Step Ladder

There is needed a design for a pressed metal step ladder that will be as light as a wooden ladder. Such a ladder would be worth at least $25,000 to its inventor.

Vacuum to Blow Ashes Out of Chimney

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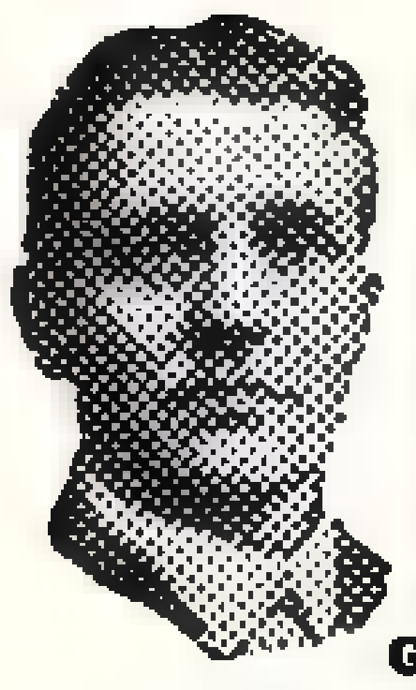

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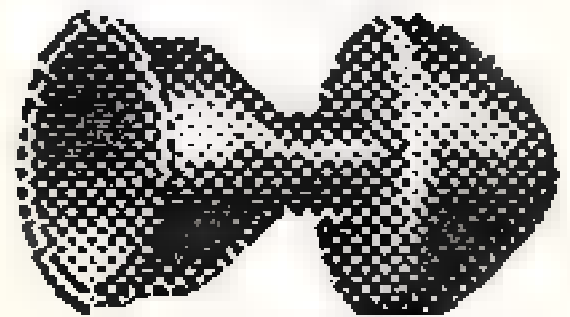

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● ● ● ● ●

CLARENCE A. O'BRIEN
Registered Patent Attorney
317-C Adams Bldg., Washington, D. C.

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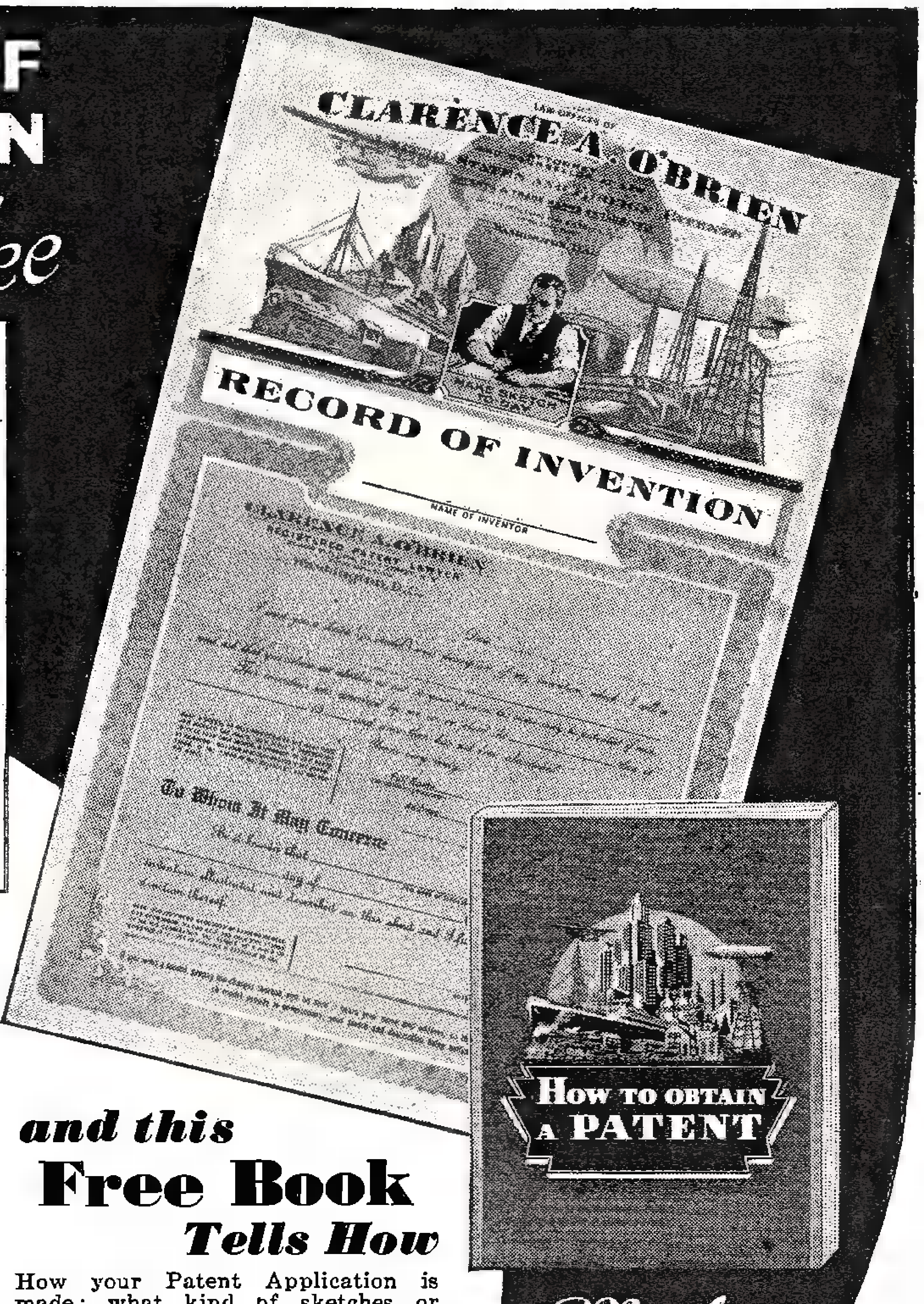
RECORD OF INVENTION BLANK *Free*

I will send you my Record of Invention form FREE. This blank will enable you to make a sketch of your idea in proper form and have it witnessed in such manner that it may be of value to you as evidence should the occasion for evidence arise. In my book, I tell you how to use this form to protect your interests.



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RECORD OF INVENTION

NAME OF INVENTOR

To Whom It May Concern

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How your Patent Application is made; what kind of sketches or drawings are necessary; what other papers must be made out; how the Patent Laws protect you; why it is important to avoid loss of time in getting your application filed; and many other important points. Even a very simple idea, if new and useful, may prove very valuable. You may have much to gain and nothing to lose by sending for this book TODAY.

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I WON $5,000.00 ANNA JACOBSON-N.J.
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Now—100 MORE Cash Prizes Being Given Away

Would YOU, TOO, Like to

Win $2,500.00

or Buick Sedan & $1,000.00?

DO YOU want money?—a small fortune?—$2,500.00 in *real* Cash? Here's your opportunity! And not one cent of your money is required now or ever to win it. This is our sensational new way to advertise. We want people everywhere talking about our company *quick*. So we are *giving away thousands* of Dollars—real fortunes—100 cash prizes totaling over $5,000.00—besides thousands of dollars in Extra cash rewards. *Everybody* can share in these cash rewards. Wouldn't you, too, like to win a brand new Buick Sedan and $1,000.00 (or $2,500.00 all cash)?

Can YOU Find 4 Dogs in Picture at Right?

Some are upside down. Some sidewise. Can you find 4 dogs? Mark the dogs you find, clip picture and mail quick. *Hundreds* of people have won thousands of dollars in cash rewards in other advertising campaigns conducted by men in this big company. Above are a few. Now comes *your* chance. Maybe this great opportunity sounds like a dream to you, but I'll be happy to send you the $2,500 or Buick and $1,000.00 the minute you win it.

Not a Penny of Your Money Needed

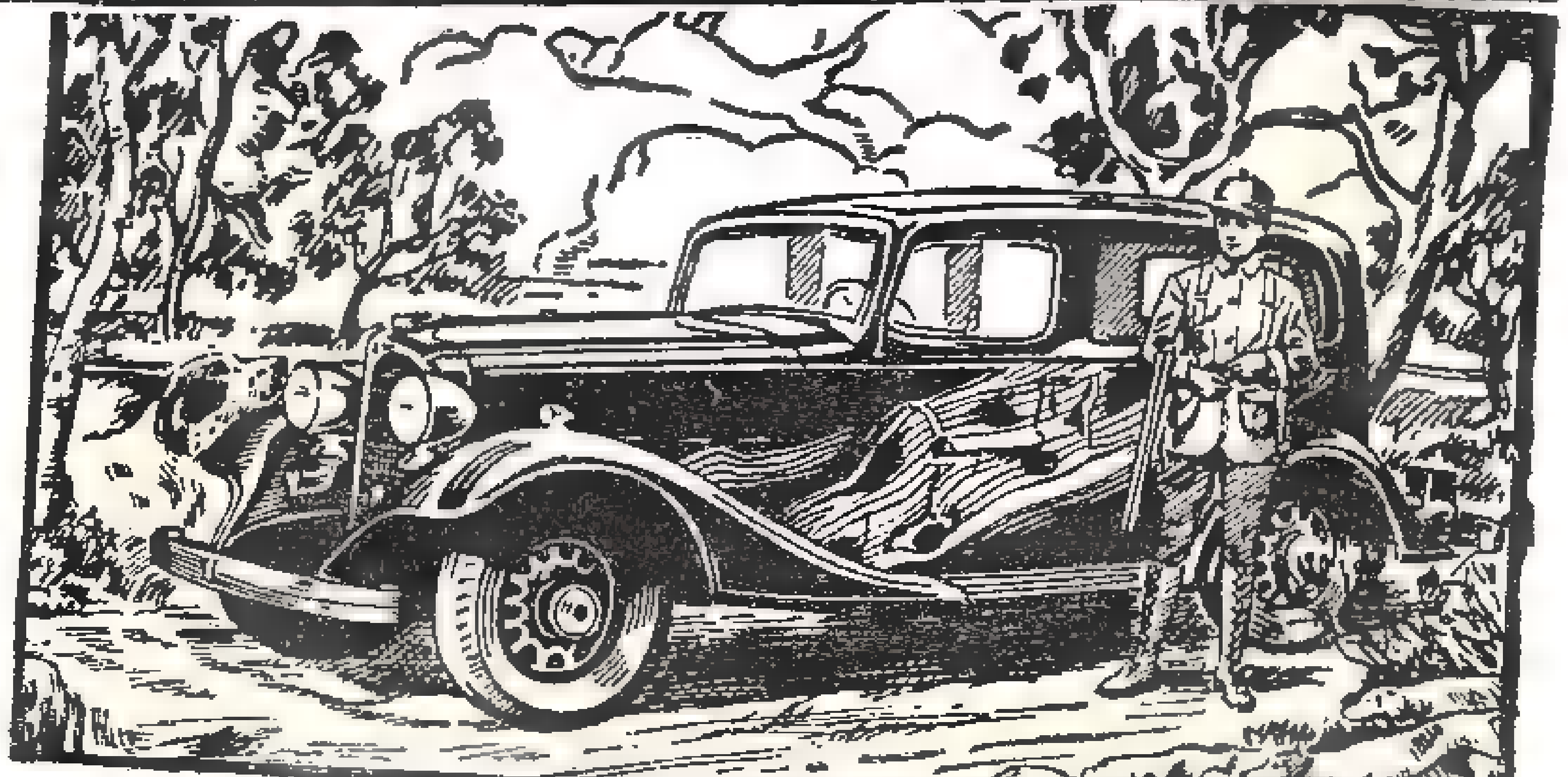
All these prizes are being given *outright* to winners. Not a penny of your money needed to buy *anything*. *Not* a lottery. No luck or skill needed. Nothing to write. Imagine the joy of receiving a letter from me with $2,500.00 in it! Oh, boy, what a thrill! Hurry—get started quick by finding 4 dogs. *Nothing* for you to lose.

You Are SURE to Win

a Cash Reward if You Do as I Ask

You are absolutely GUARANTEED to win a cash reward if you take an active part. But hurry! First active, first rewarded! Think of all the happiness $2,500.00 can bring you! We are reliable! I invite you to look us up through any credit agency, any bank in Des Moines, any business house, railroad, express company, magazine, newspaper. . . . We are well known national advertisers.

$10,000.00 REWARD We will pay $10,000.00 forfeit to any worthy charity if anyone can prove that we do not really give away all these thousands of dollars in prizes—or that all this prize money is not in the bank waiting to promptly pay every prize winner—or that we will not fulfill every guarantee we make. We are a big, responsible firm.



ALL PRIZE MONEY NOW IN BANK

All the thousands of dollars to pay every prize winner is now in the big, strong Bankers Trust Co. bank in Des Moines.

$1,000.00 EXTRA FOR PROMPTNESS

I will pay First Grand Prize winner $1,000.00 extra just for promptness—a Buick and $1,000.00 (or $2,500.00 if all cash is preferred). Do you want it? Then hurry. Not only *one* person, but *hundreds will win* cash rewards. In case of ties duplicate prizes will be given.

MAIL COUPON QUICK

Just mark the dogs you find, clip picture and mail quick with coupon below—or write on a penny post-card how many dogs you find. Don't send a cent. For replying I will tell you how you may share in thousands of dollars in EXTRA cash rewards and win $2,500.00, too. Answer today.

Tell me which you desire to win—$2,500 all cash or Buick and $1,000.00? Merrold Johnson, Prize Mgr., Dept. 231, Des Moines Iowa

Merrold Johnson, Prize Manager,
Dept. 231, Des Moines, Iowa.
I have found 4 hunting dogs in your picture and I am anxious to win.

Name.......................................

Address.......................................

City.............................State.......

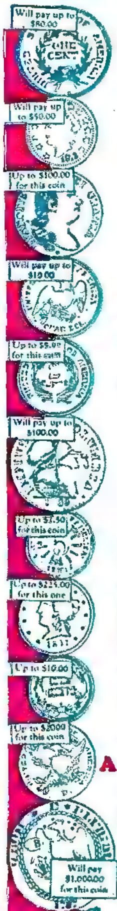
(Mark in square which you would prefer to win.)
☐ Buick and $1,000.00, or ☐ $2,500.00 All Cash.

Pays Big CASH Prices *for* OLD MONEY

COINS - BILLS - STAMPS

B. MAX MEHL

Head of Numismatic Company, Fort Worth, Texas. He has shown thousands how to turn old coins into new riches.


Will pay up to $80.00
Will pay up to $50.00
Up to $100.00 for this coin
Will pay up to $10.00
Up to $8.00 for this coin
Will pay up to $100.00
Up to $3.50 for this coin
Up to $225.00 for this one
Up to $10.00
Up to $20.00 for this coin
Will pay $1,000.00 for this coin

Amazing Profits for those who *know* OLD MONEY!

There are single pennies that sell for $100.00. There are nickels worth many dollars—dimes, quarters, half dollars and dollars on which big cash premiums are paid. Each year a fortune is offered by collectors for rare coins and stamps for their collections. The prices paid are amazing.

I PAID $200.00 to J. D. Martin of Virginia

FOR JUST ONE COPPER CENT

> "Please accept my thanks for your check for $200.00 in payment for the copper cent I sent you. I appreciate the interest you have given this transaction. It's a pleasure to do business with a firm that handles matters as you do. I wish to assure you it will be a pleasure to me to tell all my friends of your wonderful offer for old coins." *Julian D. Martin, Va.*

This is but one of the many similar letters we are constantly receiving. Post yourself! It pays! We paid Mr. Manning, New York, $2,500.00 for a single silver dollar. Mrs. G. F. Adams, Ohio, received $740.00 for some old coins. We paid W. F. Wilharm, of Pennsylvania, $13,500.00 for his rare coins. I paid J. T. Neville, of North Dakota, $200.00 for a $10 bill he picked up in circulation. In the last thirty years we have paid hundreds of others handsome premiums for old bills and coins.

All Kinds of Old Coins, Medals, Bills and Stamps Wanted

$1.00 to $1,000 paid for certain old cents, nickels, dimes, quarters, etc. Right now we will pay $50.00 for 1913 Liberty Head nickels (not buffalo), $100.00 for 1894 dimes, "S" Mint, $8.00 for 1853 quarters, no arrows, $10.00 for 1866 quarters, no motto, $200.00 each for 1884 and 1885 Silver Trade Dollars, etc.etc.

POSTAGE
2
CENTS
PHILIPPINES

Mehl Bldg., Home of Numismatic Co. Est. 31 yrs.

Big Cash Premiums for Hundreds of Coins Now Circulating

There are literally thousands of old coins and bills that we want at once and for which we will pay big cash premiums. Many of these coins are now passing from hand to hand in circulation. Today or tomorrow a valuable coin may come into your possession. Watch your change. Know what to look for.

It Pays to Post Yourself on the Big Values of Old Coins and Stamps

Knowing about coins pays. Andrew Henry, of Idaho, was paid $900.00 for a half-dollar received in change. A valuable old coin may come into your possession or you may have one now and not know it. Post yourself.

Huge Premiums for Old Stamps

Some old stamps bring big premiums. An old 10c stamp, found in an old basket, was recently sold for $10,000.00. There may be valuable stamps on some of your old letters. It will pay you to know how to recognize them.

Let Me Send You My Big Illustrated Coin Folder! It Will Open Your Eyes! Use the Coupon Below!

Send the coupon below and 4 cents for my Large Illustrated Coin and Stamp Folder and further particulars. Write today for this eye-opening, valuable wealth of information on the profits that have been made from old money. No obligation on your part. You have nothing to lose—everything to gain. It may mean much profit for you.

FILL OUT AND MAIL NOW!

NUMISMATIC COMPANY OF TEXAS
286 Mehl Building, Fort Worth, Texas

Dear Mr. Mehl: Please send me your Large Illustrated Coin and Stamp Folder and further particulars, for which I enclose 4 cents.

Name

Address

City State

SEND FOR IMPORTANT COIN FOLDER TODAY!

LONG NEEDED INVENTION SWEEPS COUNTRY

A BUSINESS IN THE PIONEER STAGE, AS NEW AS AIR CONDITIONING, PAYING PROFITS COMPARABLE TO PROFITS MADE IN EARLY DAYS OF RADIO AND AUTOMOBILES

INSTALLATIONS FROM $7.50 TO $150.00 AND UP ON WHICH SALESMAN MAKES $5.00 TO $116.70 AND UP.

This is a call for men everywhere to handle exclusive agency for one of the most unique business inventions of the past decade. To such men we say, "This is no doubt one of the most revolutionary money making inventions that has ever come to your attention." To those who ask, "Is it some clever new gadget?" we say, emphatically, "NO! This is no knick-knack, no trick filing idea—no new kind of adding machine—not a check protector." Instead, it is an invention needed by the smallest business man as well as the largest corporation and it has already saved countless thousands for the business firms which have adopted it. AND, in so doing, IT HAS PAID THOUSANDS TO THE SALESMEN WHO HAD THE GOOD LUCK TO BE THE FIRST TO SEE OUR NEWSPAPER HELP WANTED ADVERTISEMENTS! Think of it! One of these first men has already made over 1,000 sales—each of these sales paying a profit of $5 to $60—truly a fortune in profits on the 1,000 sales! Another's record shows $1,080 profit in 23 days! Still another's orders give him a profit of $4,920 in three months! Now we know this is a great success—and now we are out to cover the entire country. Men wanted everywhere. Any man, young or mature, who grasps this opportunity, may duplicate this success. The annual business should run into millions. We feel it will be worth while for every man who realizes the importance of this opportunity to telegraph, or rush by fastest mail, the coupon for our proposition.

RECORD SALES made to leading firms, foremost institutions in America. Examples shown in this photo: 1. One of the offices of a leading Middle West Public Utility Corporation. 2. A famous sporting goods manufacturing house. 3. A world-famous department store. 4. A renowned mercantile house. 5. A great steel corporation. 6. An important warehouse organization. 7. A great banking house. 8. A noted, historically famous hospital. 9. A celebrated newspaper.

Saves Thousands of Dollars for Offices, Stores, Factories

What is this remarkable invention? You have to see what it is, read all about it, what it has accomplished, to believe it is possible. This astounding record of accomplishment is reported and verified over the signatures of many of America's finest and most distinguished business houses. Large firms are not the only beneficiaries—small organizations are enjoying tremendous dividends, too. Sanders Ridgeway of Kansas invests $88.60, saves $4,707.00 between April 5th and June 29th. Fox Ice and Coal Co., Wisconsin, saves $3,564.00. Baltimore Sporting Goods Co. saves $1,600.00 on $45 installation. L. S. Warner Merc. Co., Texas, saves over $1,000 on $15 installation. Safety Auto Lock Co., New York, gets $15 installation, saves $686.45. With these and scores of similar results to display, our representatives interest every business man, from the very smallest to the very largest. No one can dispute the proof in the photo-copies of actual letters which our men show.

Installed on Free Trial—Sells Itself—Saves Enough to Pay for Itself Before Salesman Returns

We actually enable you to make installations at our risk, let the customer sell himself after the installation is in and working. This does away with the need for high pressure selling—it eliminates the handicap of trying to get money before customer is really convinced. You simply tell what you offer, show proof of success in every line of business and every section of the country. Then install our invention without a dollar down. It starts working at once. In a few short days, the installation has actually produced cash money that is there and available to pay for the deal, with profits above the investment coming in at the same time! You then call back, collect your money. Think of it! Out of every $75 business you do, nearly $60 is your own profit! The very smallest you make is $5.00 on a $7.50 installation! Nothing is so convincing as our offer to let results speak for themselves without risk to the customer!

Each Installation Leads to Automatic Repeat Sales

No need to go elsewhere, once you have sold every good prospect in town. You may stay where you are and build up a permanent substantial business. Every pleased customer needs "refill" supplies constantly. You make exactly the same commission on these big repeat orders as you do on the original sale. Washington Sanitarium and Hospital writes, "We have already used more than ten installations of the large size so far." H. C. Heath writes, "We have only 13,000 population and I have already sold 76 installations, many of which repeated, and the above order makes 128 units for yours truly." Practically every time you establish a new customer, you increase your *permanent income* from *repeat business.* This enables you, on exclusive contract, to build an established, permanent route of customers which can be sold anytime like any other established business.

SALESMEN NEEDED EVERY WHERE

YOU RISK NO MONEY in trying out this business. Complete Training furnished. Every man with us today started at scratch, without previous experience, many coming out of clerking jobs, many out of small businesses, some out of large concerns. Can't possibly tell you all in the limited space available here. **Mail the coupon now for full information—nothing to risk, everything to gain.**

A Business of National Importance

As well as selling thousands of installations to small merchants, professional men, etc., we number the parent companies, branches, or dealers, etc., of world-famed concerns among our customers: Cities Service Oil Co., Great Lakes Fisheries, Inc., National Majestic Radio, Chevrolet, Chrysler, Damascus Steel Products, Public Utilities Consolidated Corporation, Union Gas Corp., Coca-Cola Bottling Co., National Radio, Timken Silent Automatic Co., Central States Petroleum, United Aluminum Corporation, Street Railways Advertising Co., Great American Life Underwriters, National Paper Co., and scores of others nationally known. Universities, newspapers, doctors, etc., buy substantial installations and heavy repeat orders.

Your Customer Takes No Risk

Customer gets signed certificate guaranteeing cash profit on his investment. Very few business men are so foolish as to turn down a proposition guaranteed to pay a profit, with proof from leading concerns that it does pay. *Protected by surety bonded national organization.*

No Canvassing No Supersalesmanship

Communicate with Us at Once

If you have not already heard of this invention being sold in your territory, lose no time but get in touch with us immediately. This specialty is as important a business opportunity today as the typewriter, adding machine, and the dictaphone were in their early days. Men who can take the measure of an opportunity will see this instantly. If you can show us you are the right man for exclusive franchise in your territory, your future is assured. *Write or wire at once. If writing, use the coupon below for convenience.* No obligation. Full information will be sent to you at once.

F. E. ARMSTRONG, Pres.
Dept. 4019-B, Mobile, Ala.

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Without obligation to me, send me full information on your proposition.

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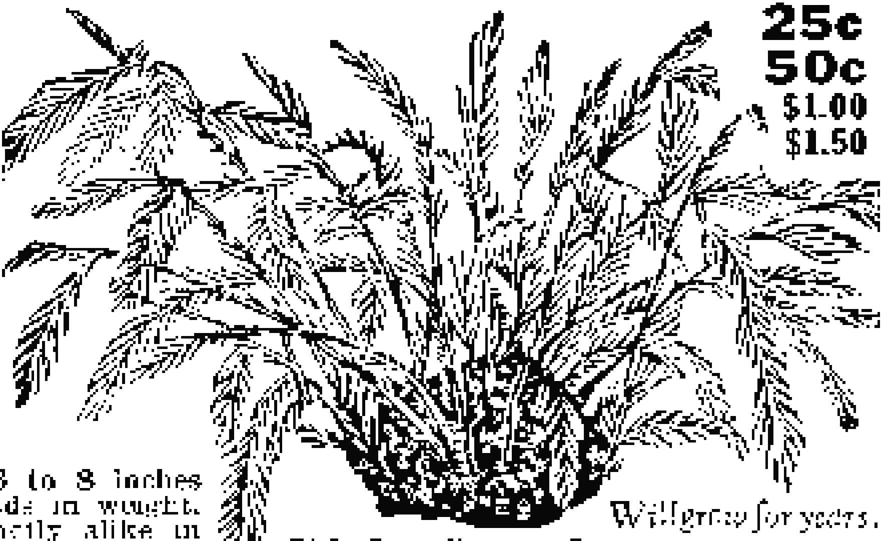
CALIFORNIA REDWOOD BURLS

A Very Charming Horticultural Novelty



This **Burl** is a growth of the famous **CALIFORNIA GIANT REDWOOD TREE** and when removed from the tree and placed in a bowl in about one-half inch of water, it starts growing and sends forth the **BEAUTIFUL REDWOOD TREE FOLIAGE** and brings the **FRAGRANCE OF THE WOODS** into your home. Changing the water once a week and being careful they do not dry out is all the attention they need. You will enjoy watching them grow. As a house plant they have no equal. They are extremely hardy and will grow for years anywhere. They do not need any sun. The one illustrated is two years old.

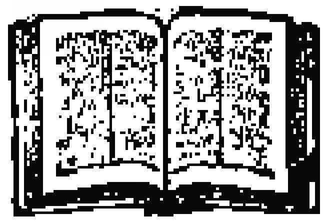
The Burls are graded and sold according to size and thickness. The smallest size is about 2 inches long, weighs about 4 ounces and sells for 25c. The next size sells for 50c and is somewhat larger and thicker. The next size is still larger and sells for $1.00. The Largest size at $1.50 is quite thick and heavy, is 6 to 8 inches long by about 5 inches thick and averages about 2 pounds in weight. We cannot give exact measurements as no two are exactly alike in size or shape. Shipped prepaid. Johnson Smith & Co., Dept. 719 Racine, Wis.

PLACE IT IN WATER WATCH IT GROW

MAKEYOUROWNRADIO

Enjoy the concerts, baseball games, market reports, local news, etc. This copyrighted book "EFFICIENT RADIO SETS" shows how to make and operate inexpensive Radio Sets, the materials for which can be purchased for a mere trifle. Also tells how to build a short-wave Receiver for bringing in foreign stations, police calls, ships at sea, etc. ONLY 15c p.pd.

MIDGET BIBLE

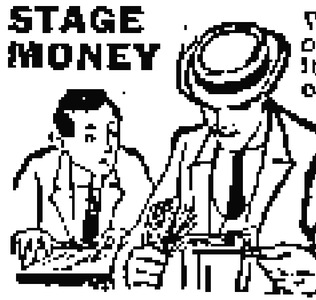


GREAT CURIOSITY Smallest Bible in the World. Size of a postage stamp. 200 Pages. Said to bring good luck to the owner. A genuine work of art. Must be seen to be appreciated. Make good money selling them to friends, church acquaintances, etc. PRICE 15c each, 3 for 40c, 12 for $1.35, 100 for $7.50. Also obtainable in Leather Binding, with gold edges. Price 50c each, 3 for $1.25, $4.50 per doz. Magnifying Glass for use with Midget Bible 15c.

SERPENT'S EGGS

Box contains 12 eggs. When lit with a match, each one gradually hatches itself into a snake several feet long, which curls and twists about in a most life-like manner. Price per box, 10c postpaid, 3 for 25c.

STAGE MONEY



With a bunch of these bills, it is easy for each person of limited means to appear prosperous by flashing a roll of these bills at the proper time and peeling off a genuine bill or two from the outside of the roll, the effect created will be found to be all that can be desired. Prices, postpaid: 40 Bills 20c, 120 for 50c, or $3.50 thousand postpaid.

NOSE FLUTE

Post Paid 10c

The Magic Nose Flute, or Hu-manatone, is a unique and novel musical instrument that is played with nose and mouth combined. There is just a little knack in playing it which, when once acquired after a little practice, will enable you to produce very sweet music that somewhat resembles a flute. There is no fingering, and once you have mastered it you can play all kinds of music with facility and ease.

JOHNSON SMITH & CO.

250 MAGIC TRICKS

MAGIC MADE EASY

An excellent little book explaining nearly 300 tricks for parlor or stage that anyone can do. Tricks with cards, coins, handkerchiefs, eggs, letters, rings, etc. Also Second Sight, Shadowgraphy, etc. Profusely illustrated. 10c postpaid.

125 CARD TRICKS and sleight of hand. Contains all the latest and best card tricks as performed by celebrated magicians, with exposés of card tricks used by professional gamblers. Price 25c postpaid. Canada stamps.

SURPRISE MATCHES

More fun than fighting with your wife. Look just like ordinary matches. As the victim tries to light one he gets quite a surprise.

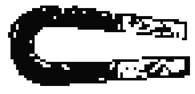
Price 10c per box, 3 boxes for 25c, 12 for 75 cents.

STAR TOY MAKER

Greatest boys' book written. Tells how to make a Pinhole Camera, a Canoe, model Railroad, a Telephone, Boomerang, Telegraph Instrument, Box Kite, Talking Machine, Microscope, Electric Motor, Electric Door Bell, Water Wheel, Paddle Raft, a pair of Skis, a Dog Sled, Bird House, Rabbit Yard, etc. 64 pages. 100 illustrations. PRICE 10c.

BOY'S OWN TOYMAKER. A new book. Tells how to make mechanical toys, electrical toys, aeroplane toys, mechanical toys, paper toys, cardboard toys, boats, traps, etc. 200 illustrations. Price 25c postpaid.

FUN WITH MAGNETISM. 60 novel and unique experiments in **MAGNETISM** that you can perform with the aid of an ordinary magnet; magnetic chair, fencing and dancing needle, pail and ball chaser, magnetic fish, top, motor, magnetic billiard balls, many others. Also interesting information about magnetism, magnetism, electricity, etc. PRICE 10c p.pd.



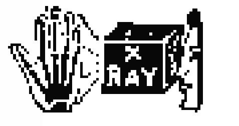
BOOK ON BOATS. How to build rowing, sailing boats. Everything pertaining to boats explained in plain terms so anyone can understand. Illustrated. 10c p.pd.

5-MINUTE HARMONICA COURSE. A new easy self-teaching method. Teaches how to play, to use the tongue, tremolo, fully illustrated. Price 15c postpaid.

MONEY MAKING SECRETS. Golden opportunities for everyone. 64 page copyrighted book chock full of money-making ideas, recipes, formulas, wrinkles, trade secrets, etc. Business that can be started with little or no capital at home in spare time. 10c postpaid.

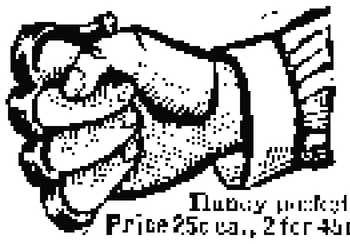
TRICKS & SOCIAL ENTERTAINER. Contains hundreds of simple tricks, illusions, diversions that anyone can do. Also explains secret of second sight. Price 25c postpaid.

WONDERFUL X-RAY TUBE



A wonderful little instrument producing optical illusions both surprising and startling. With it you can see what is apparently the bones of your fingers, the lead in a lead pencil, the interior opening in a pipe stem, and many other similar illusions. Price 10c, 3 for 25c.

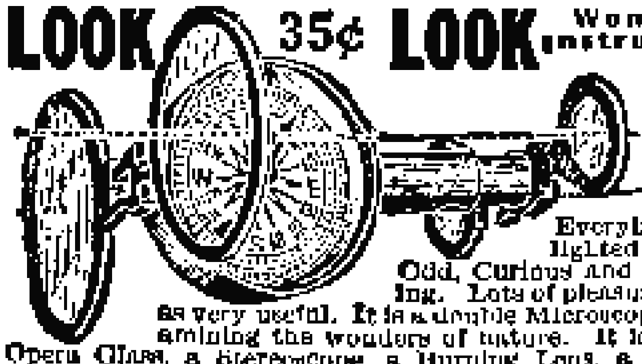
SILENT DEFENDER



Used by police officers, detectives, sheriffs, night watchmen and others as a means of self protection. Very effective. Easily fits the hand, the fingers being grasped in the four holes. Very useful in an emergency. Made of aluminum they are very light, weighing less than 2 ounces. Handy pocket size always ready for instant use. Price 25c ea., 2 for 45c postpaid. *770 page Catalog 10c.*

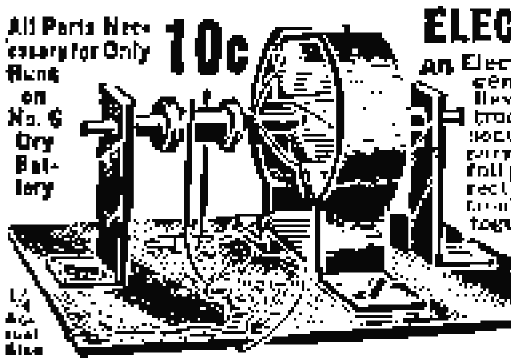
LOOK 35¢ LOOK

Wonderful instrument.



Greatest thing yet. Nine separate articles in one. Everybody delighted with it. Odd, Curious and interesting. Lots of pleasure as well as very useful. It is a double Microscope for examining the wonders of nature. It is also an Opera Glass, a Stereoscope, a Burning Lens, a Reading Glass, a Telescope, a Compass, a pocket Mirror, and a Laryngoscope—for examining eye, ear, nose and throat. It is worth all the cost to locate even one painful cinder in the eye. Folds flat and fits the pocket. Something great—you need one. Don't miss it. Sent by mail. Only 35c or 3 for $1.00.

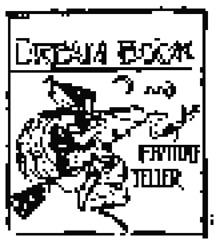
ELECTRIC MOTOR


All Parts Necessary for Only 10c
Runs on No. 6 Dry Battery
1/4 Actual Size

An Electric Motor for Only 10 cents. Sounds almost unbelievable, but it is perfectly true. For ONLY 10 cents we send you all the parts necessary packed in a neat box with full printed and illustrated directions for assembling. No trouble at all putting the parts together. In fact it is FUN. Just follow a few simple instructions and within a few minutes the motor is ready to run.

Price postpaid, 10c

Tell Your Own Fortune



With the aid of this dream book and fortune-teller. The key to your future. Will you be lucky in love? Be successful in business? Will you be wealthy? Complete with dictionary of dreams with descriptions and correct interpretations, with lucky numbers, fortunate days, oracles, divination, palmistry, etc. Also tells how to tell fortunes by various methods, by grounds of coffee or tea, by dominoes, by moles, cards, ... etc., lucky days, weeks, months, years; how to receive oracles by dreams, finger nail observations, etc. PRICE 10c

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This remarkable book tells how. Explains all about Hypnotism, how to hypnotize, how to produce sleep, how to awaken a subject, how to hypnotize animals, hypnotism in diseases, hypnotism for scientific purposes, illusions and hallucinations, personal magnetism, thought transference, etc. Written in plain, everyday language that anybody can understand. PRICE 10c postpaid.

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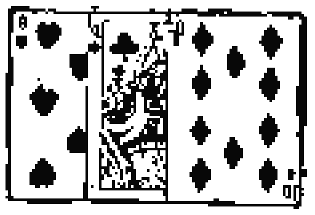

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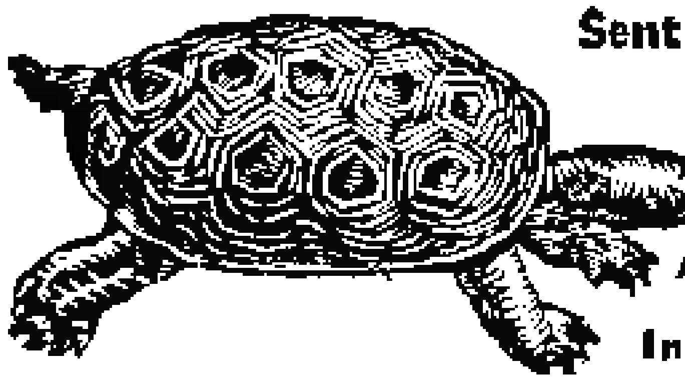

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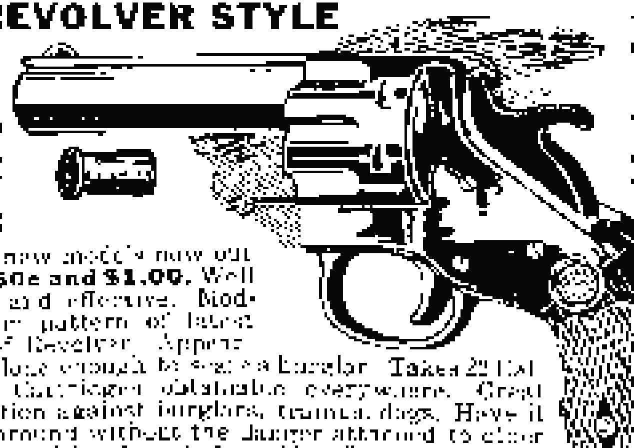

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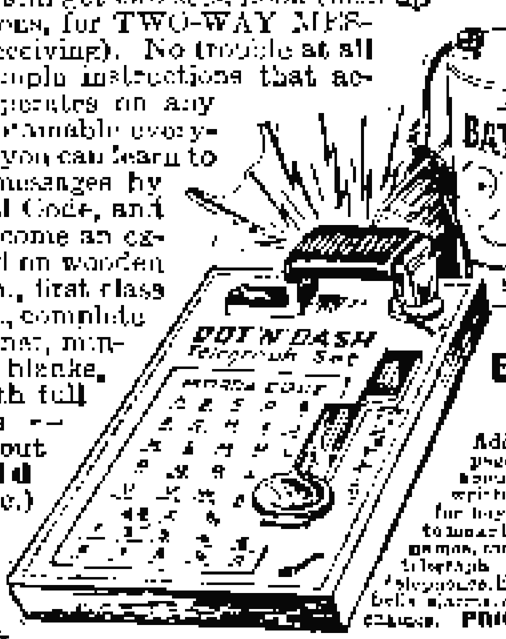
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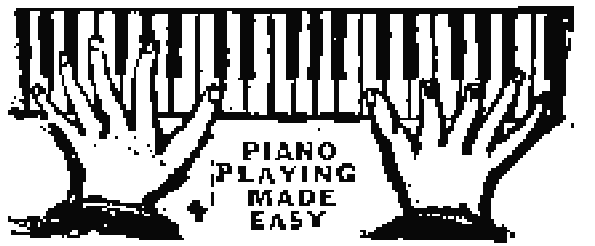

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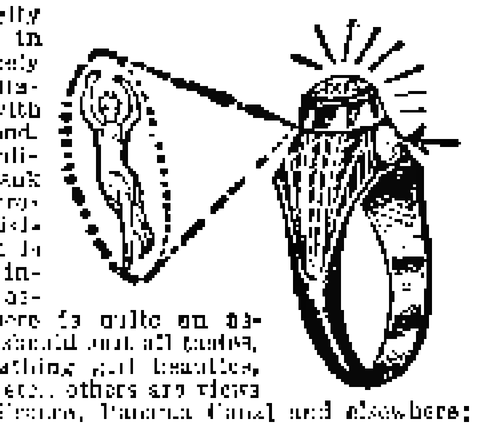

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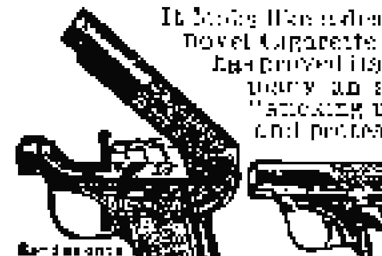

It looks like a deadly weapon, but it is merely a novel Cigarette Case. This clever contrivance has proved itself better than the real thing in many an awkward encounter. Great fun "sticking up" your friends. They squirm and protest it might be loaded. Pull the trigger and the slide flies open disclosing the cigarettes. Well made, light and compact. Weight only 2 ounces.

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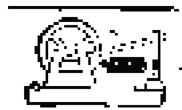

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THE BOOK ON THE NEXT PAGE IS FOR

INVENTORS

AND OTHER MEN WITH IDEAS

SOME of the world's most successful inventions came from men who didn't consider themselves inventors at all. The telegraph was invented by a painter; the typewriter by a farmer; a poet figured out the sewing machine; a school teacher the telephone; a bank clerk the hand camera and a dentist the stock ticker. Or look at small inventions: A husband noticed his wife bending a hair pin to make it stay in her hair. That gave him the idea of the crinkly hair pin, which he proceeded to patent. One day a golfer got the idea—just a hunch—to make a wooden tee. He patented his idea—and every golfer knows that wooden tees are sold by the millions every year. These are but a few of many similar examples in inventive history.

That is why we say that the book shown on the next page is for INVENTORS and Other Men with IDEAS. Some men make a business of invention. They make their living—even fortunes—that way. Other men who are not inventors at all occasionally have good, practical ideas which could be patented to their profit and with benefit to the world.

Whether you consider yourself an inventor or not—if you have a good idea; an idea that will save money, save time, save labor, make money or give pleasure—you should at least find out how you can protect your rights to it. And this interesting, new FREE book, PROFIT PROTECTION, will tell you.

Read What C. F. KETTERING Vice-Pres., General Motors says about Invention

Sometimes we hear people say: "Well, there isn't must left to invent." But Charles F. Kettering, Vice President and Head of Research of General Motors, who helped develop the self-starter, Duco, and many other outstanding inventions, **doesn't think that at all.** He thinks just the opposite. In an interview recently published in Good Housekeeping Magazine, Mr. Kettering said:

"If we took half the men employed in tool making and put them to working out new inventions, new things, we could snap out of this depression in no time. Our return to normal times depends on new manufactured products that will catch the purchaser's eye, get him to buy and thus start the ball rolling. Change and buying go together. *We're only entering the great period of inventive advancement.*"

Our Business Is to Help Inventors

For thirty-five years, this organization has been in the business of helping inventors. During that time ideas—inventions—from literally every corner of the country have been turned over to us to protect. Some of these ideas have represented large and complicated mechanisms; many others have been very small, practical articles, like a can opener or a new toy.

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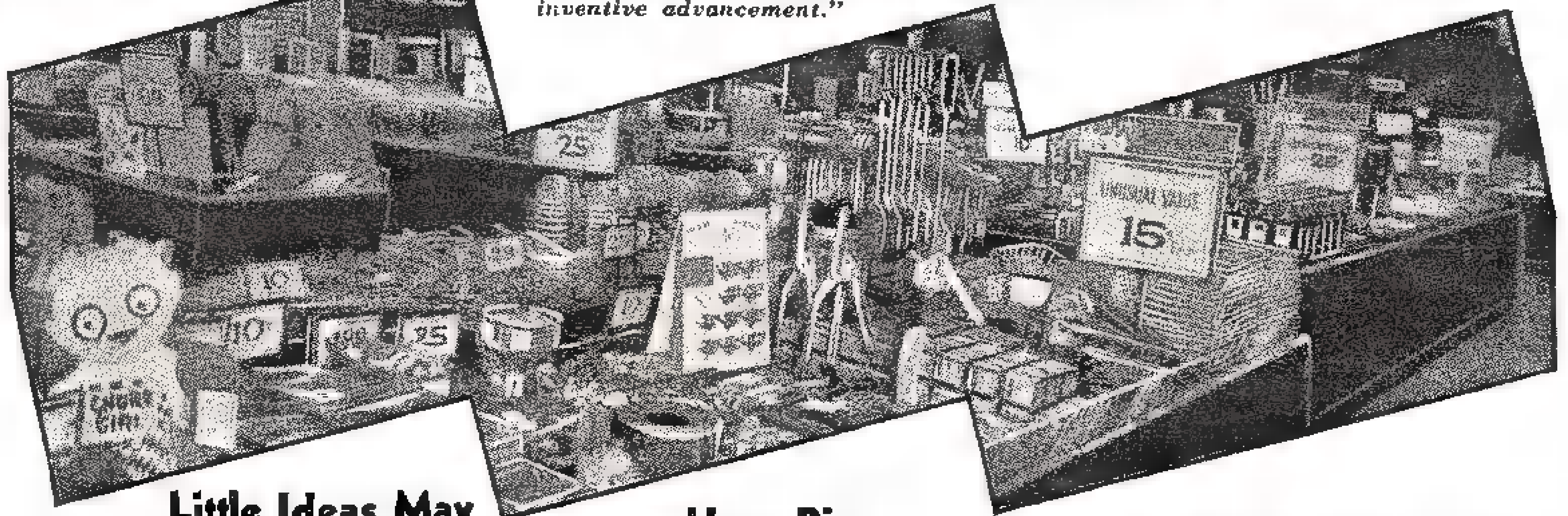
Delays Are Dangerous—Write Us Today

In inventive matters, delays can often prove very serious. It frequently happens that two or more inventors will be working on substantially the same idea without each other's knowledge. And the Patent Office rules tend to favor the man who gets his Patent Application on file first. So if you have an idea—YOUR VERY FIRST STEP is to find out exactly what to do to protect yourself. That is a step you can take today—right away in fact—by sending for your copy of PROFIT PROTECTION.



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Every year thousands of patented new articles are brought on the market—the result of someone's happy thought. Often it is these little, simple ideas—the kind you find on the counters of a 10c store like the one shown here—that are among the most successful financially. Whether your idea is simple or complex—large or small—if it is new and useful, you owe it to yourself to find out how you can protect it. Send for a FREE copy of the book, "Profit Protection" NOW.

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What simple steps you may be able to take right away to help establish your right to your idea, even before you make application for a Patent.

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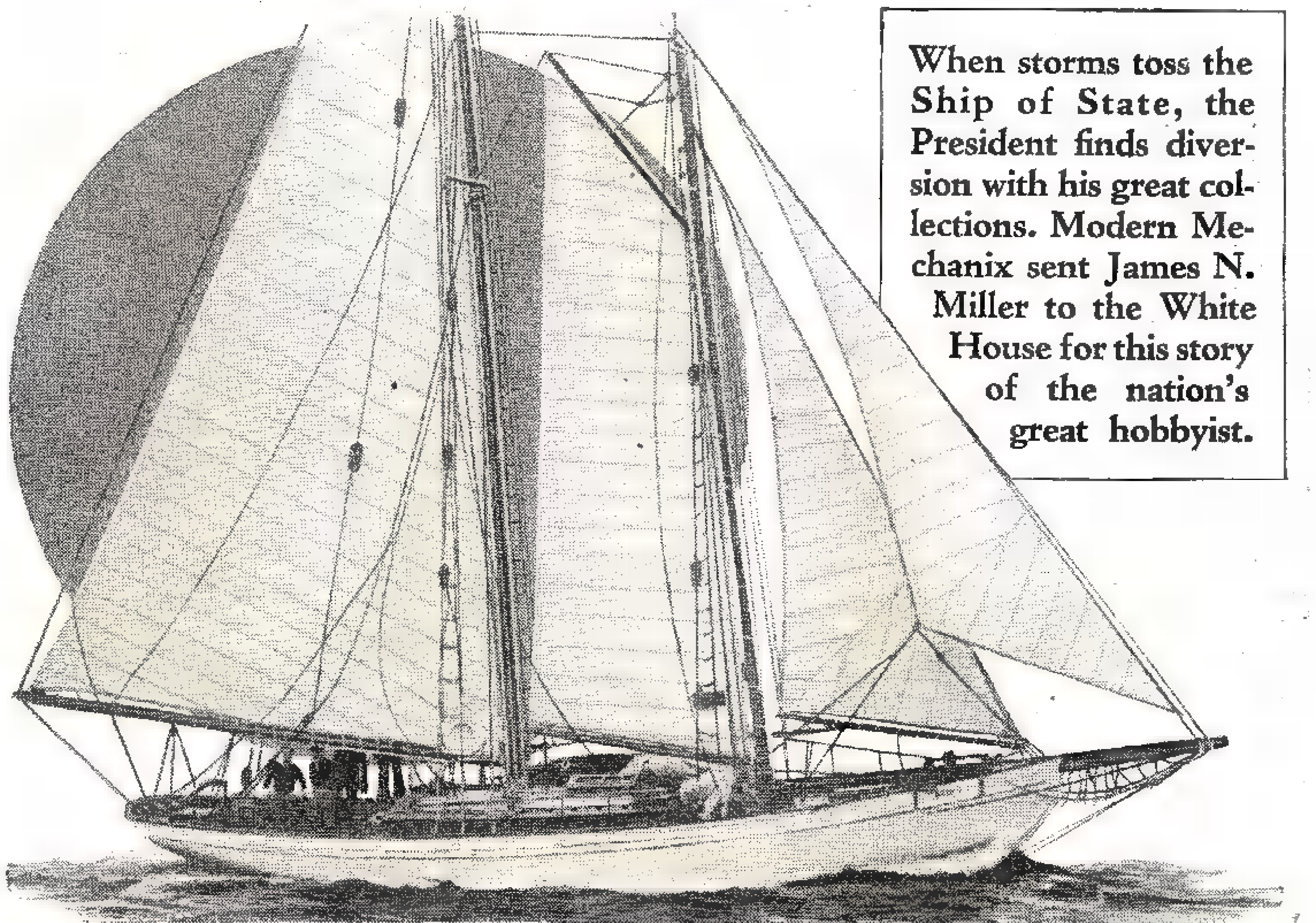
President ROOSEVELT'S White House HOBBIES

When storms toss the Ship of State, the President finds diversion with his great collections. Modern Mechanix sent James N. Miller to the White House for this story of the nation's great hobbyist.



Sailing is the President's favorite sport and his love for the sea is represented in all his hobbies. Above is a photo of the "Amberjack II", 45-foot sea-going schooner, in which he took a leisurely vacation cruise after his election.

As a boy President Roosevelt wanted to be a sailor, but his father sent him to Harvard. He enjoys sailing cruises with his sons. Here is an intimate pose of the President eating food cooked by himself on one of his vacation cruises.

by JAMES NEVIN MILLER

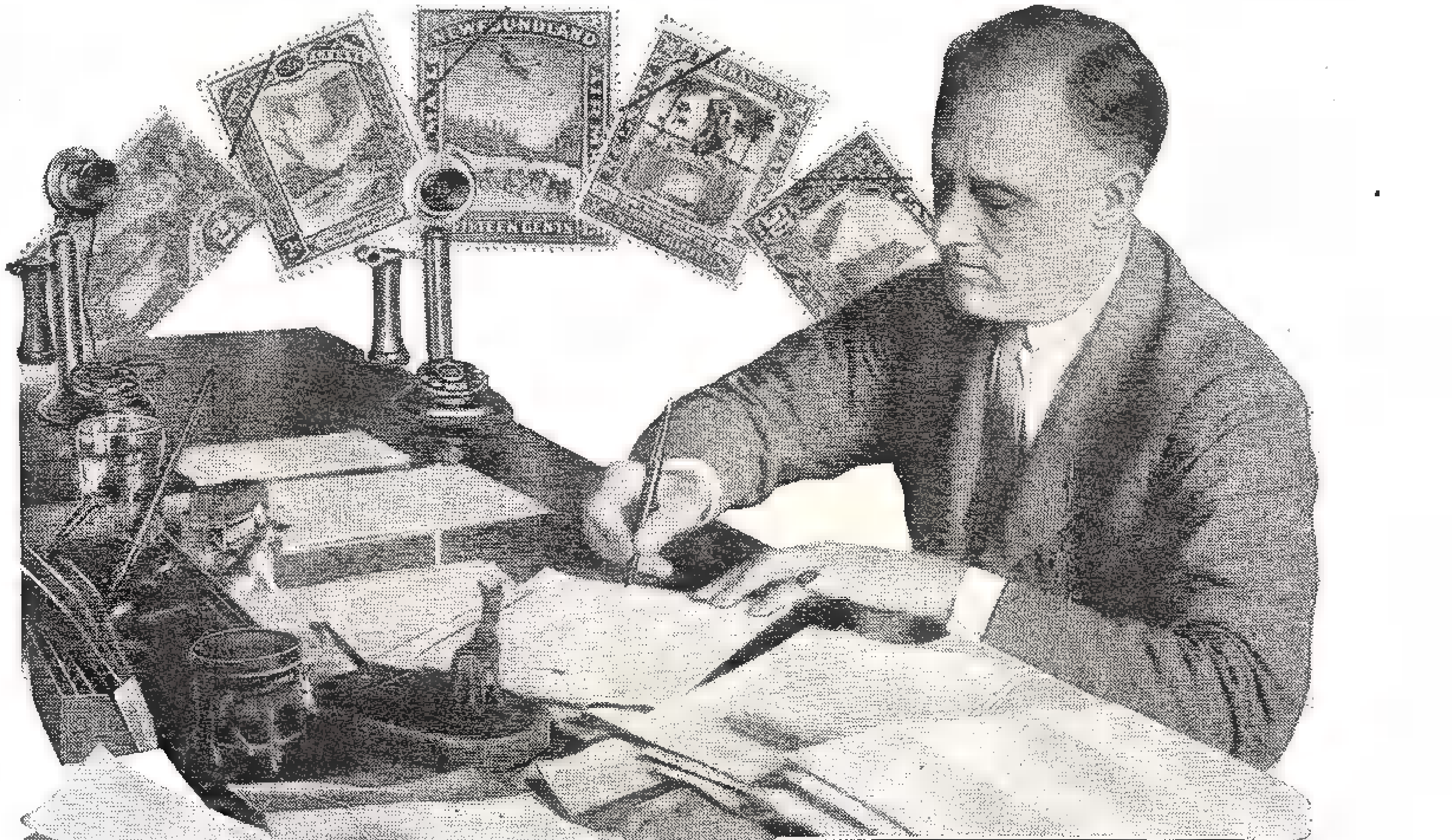
A SECRET service agent rapped on the door of the home of a retired minister in a suburb of Washington.

The clergyman opened the door. The government agent flashed his badge. Timidly, perhaps apprehensively, the minister asked the man to step into the living room.

Imagine his astonishment when the agent announced:

"Your Reverence, the President would like to have you drop in some day at the White House. He'd like to see you about your stamp collection. He says that you should bring it along so that he can take a look at it."

The clergyman, noted for his stamp collection, relaxed and excitedly replied that he would be delighted to come "whenever convenient for Mr. Roosevelt."



When the day's work is done at his desk in the White House, the President often turns to his stamp collection. He is a philatelic fan with 20,000 stamps in 30 volumes.

This anecdote is just a sidelight in the life of the nation's chief executive, but it adds to an understanding of the character of the President of the United States.

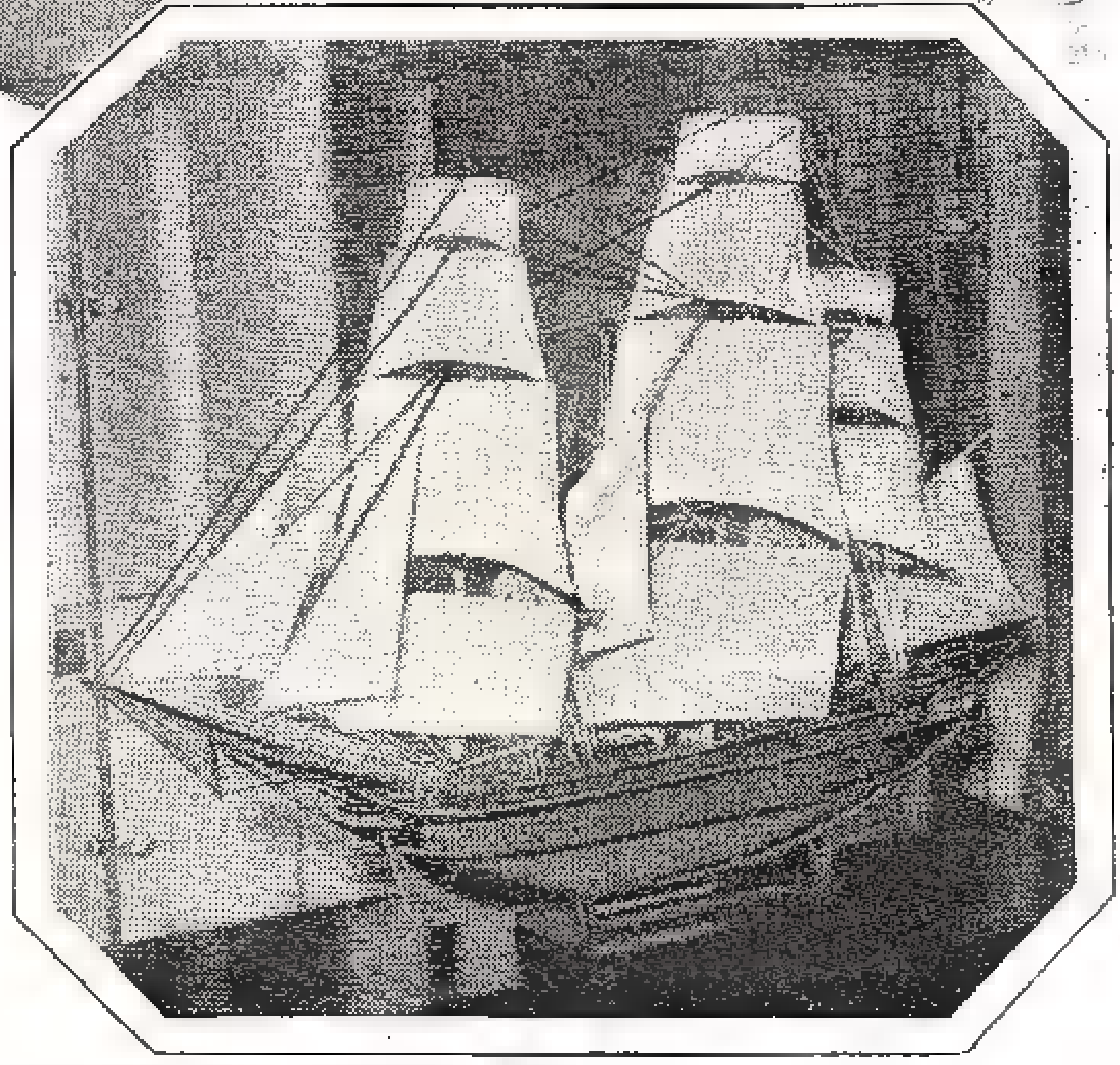
To understand great men thoroughly one should know their avocations, their hobbies, the diversions that occupy them in their leisure time.

The Prince of Wales, in addition to golfing, horseback riding, and dancing, knits and crochets. He claims that knitting rests him when he is tired. Henry Ford is fond of collecting old buildings, furniture, and vehicles. Andrew Mellon is known as a collector of paintings and rare books.

Sits in Bed Pasting Stamps

President Roosevelt might be called the nation's leading hobbyist. When the troubles of the country bear heavily upon him, the chief executive is able to forget his worries among his great collections. Sometimes far into the night he will sit in bed pasting stamps in albums.

Stamp collecting is only one of his hobbies. Love for the sea seems to dominate all his pastimes. His collection of naval books, engravings, paintings, pamphlets and ship models is considered the finest in existence in private hands.



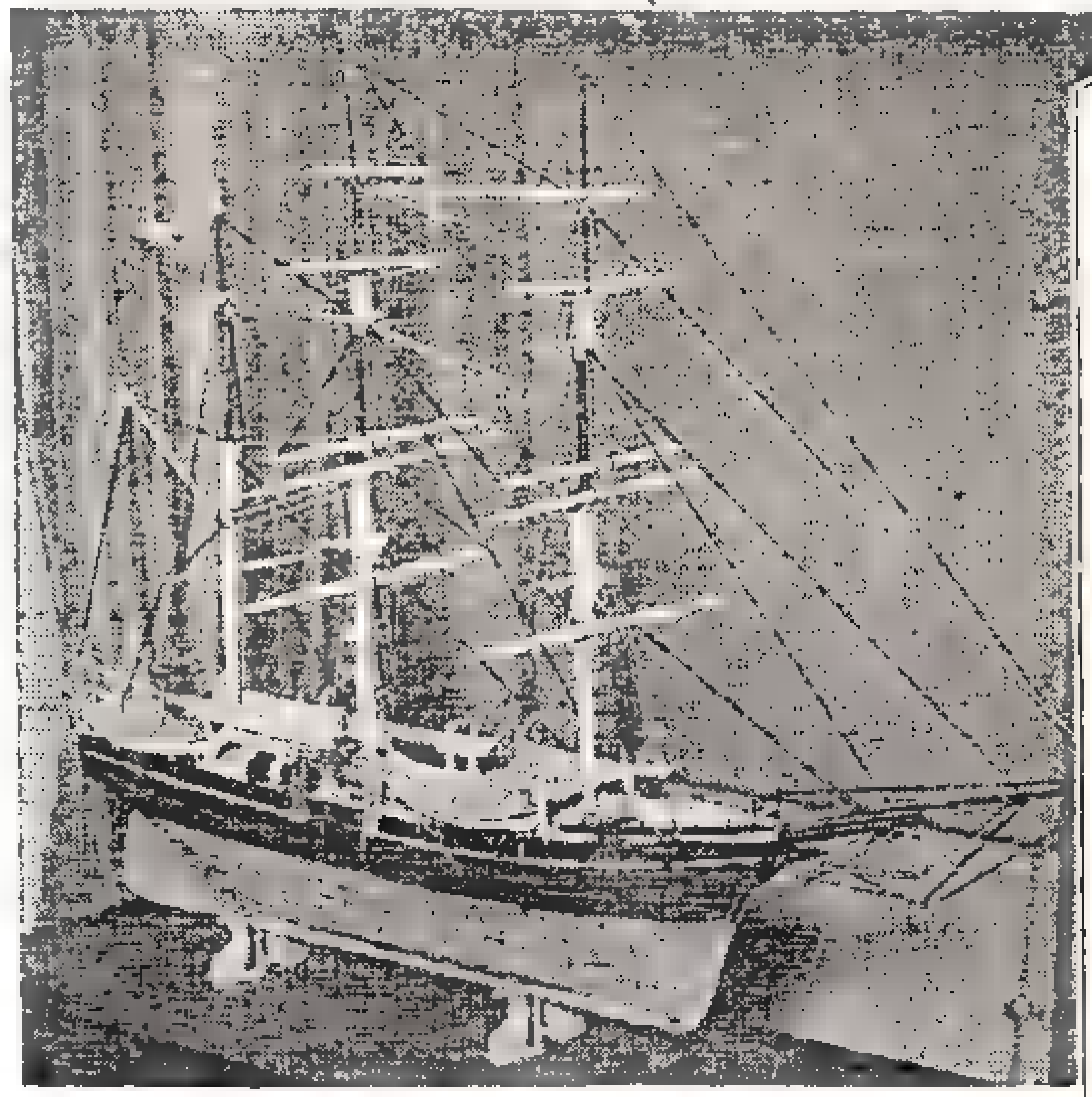
Exclusive Modern Mechanix Photo

The "Raleigh," early American war vessel, is one of the prized models in the President's collection. The models are part of a greater collection that is a realistic history of the heroic and stirring events of the United States Navy.

Except for official reports and documents, it is possibly superior to that in the Congressional Library. It consists of between 6,000 to 7,000 books, approximately 10,000 pamphlets, 450 framed lithographs and etchings and more than 60 paintings.

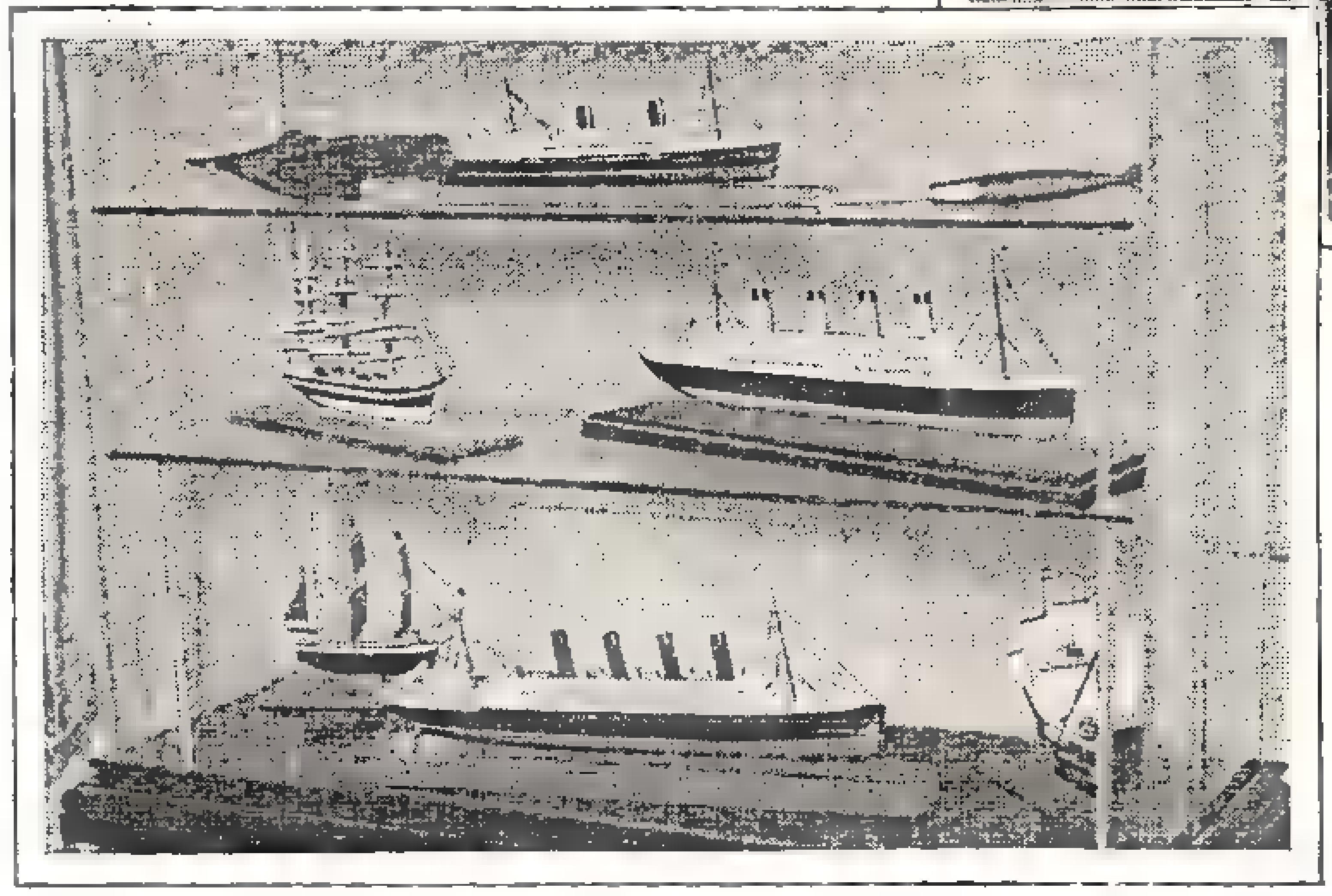
THE FIRST COMPLETE STORY OF THE NOTED COLLECTIONS OF OUR CHIEF EXECUTIVE

Numerous Famous Naval Historical Paintings Grace White House Walls



Exclusive Modern Mechanix Photo

This model of the whaling ship, "Josephine," of New Bedford, is built true to scale and is complete in all details. It is one of the prized models of the President.



When the President goes to sea in a sail boat, he handles the helm himself. He returns happy, tanned, and rested as shown above. At left is a glass case in Mr. Roosevelt's study containing eight models. Top row, left to right are, model of a whale; "La Provence," French liner; swordfish model. Middle—The "Malcolm L. Cropley," early American brig; and the S. S. "Olympic." Bottom—The Pilgrim Mayflower; the S. S. "Mauretania," another Mayflower model. The President himself has supervised the designing and building of many of his models. He has built miniatures of every home in which he has lived.

Exclusive Modern Mechanix Photo

His stamp collection consists of 20,000 stamps and 30 volumes, one of the largest in the country.

While governor of New York, Mr. Roosevelt kept his favorite Navy collection in his Hyde Park, N. Y., and New York City homes. His study, the library, even the halls and part of the staircases were almost covered with some of the finest known paintings of American ships.

At his Hyde Park estate he kept most of his favorite ship models. All of these models were made by hand and in most cases each is a perfect reproduction of an original ship. These wonderful miniatures are worth thousands of dollars.

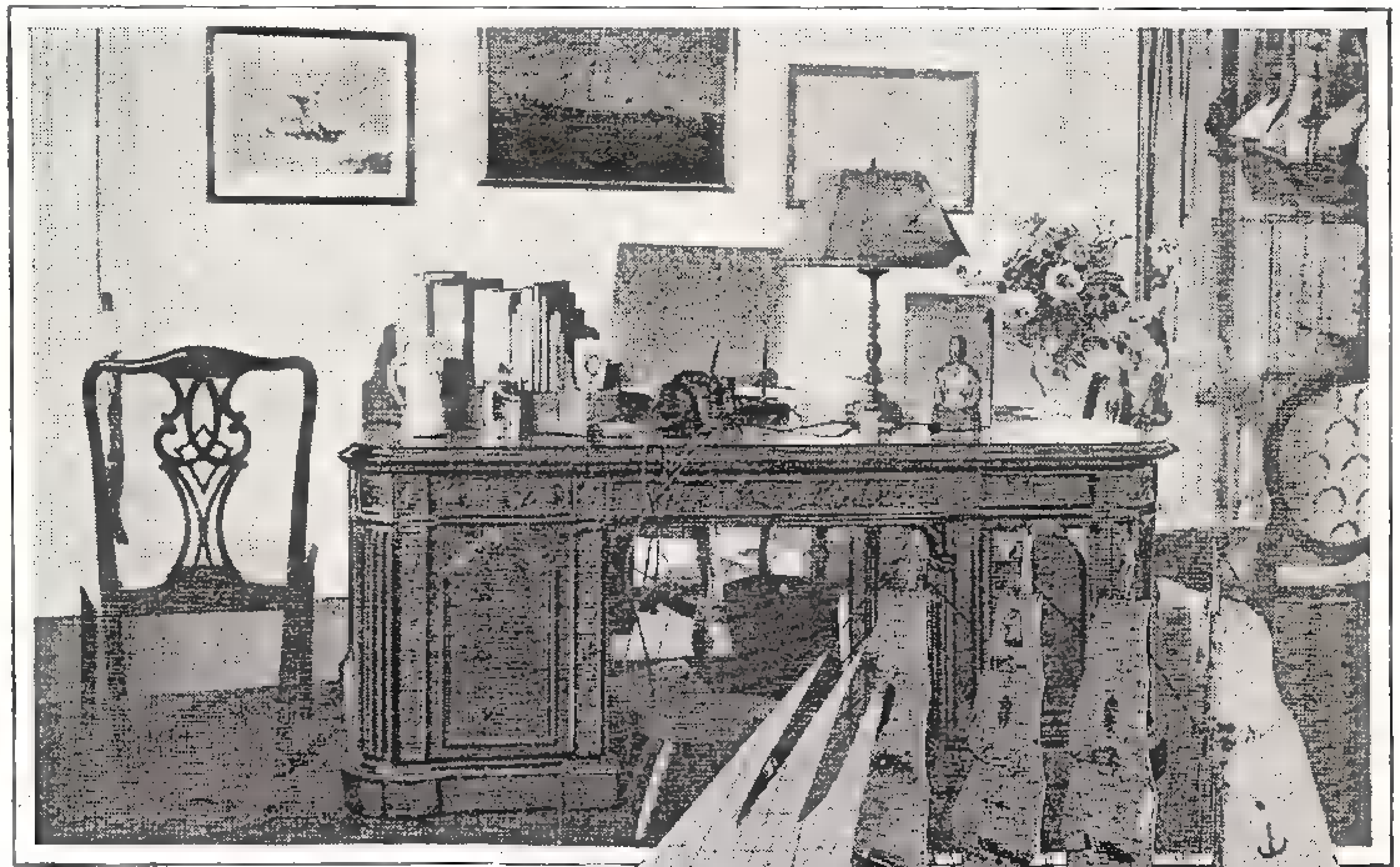
Together with the paintings and lithographs these models give a graphic and vivid history of exciting and heroic deeds of the American navy.

Upon becoming President, Mr. Roosevelt sent for only the best models and paintings. Yet there was a sufficient number to decorate three rooms of the White House: the President's bedroom, study, and office.

None but Mr. Roosevelt's most intimate friends are permitted to visit the bedroom. The study on rare occasions may be seen by authorized persons. The writer was given permission to visit the White House, and take along a photographer to view and photograph the President's hobbies.

Incidentally, before describing these collections, it would be best to reveal another interesting angle concerning the President and his avocations. The President's mother revealed that, not only does he collect models, but that he also enjoys supervising the designing and building of models of both ships and houses.

President Roosevelt Designs and Builds Many of His Own Prized Models



Above is a glimpse of the study on the second floor of the White House where the President often confers with foreign envoys. It is furnished with the most prized models and naval paintings of Mr. Roosevelt's collection. Modern Mechanix and Inventions' correspondent gives a description of the room in the accompanying article. At right is one of the models. It is a full rigged frigate, war vessel of the Revolutionary war. Hand-made in every particular, the model is worth thousands of dollars.

Every house in which Mr. Roosevelt has lived has been reproduced, under his supervision, in a miniature model. The President himself, his friends say, has built many models of houses.

Painting Saved "Old Ironsides"

Shortly after his election as governor of New York, he personally constructed an ingenious little model of the governor's mansion in Albany. He has also ingeniously built tiny models of cottages at the Warm Springs, Ga., sanitarium.

Returning to the White House—just back of the President's desk in his study is a remarkable group of paintings of early American ships, mostly men o'war. One is the famous original painting of the *Constitution*, by the noted American artist, Gordon Grant.

This is the painting that saved *Old Ironsides*, noted for her distinguished victories in the Revolutionary War and the War of 1812, from becoming a loss as a treasured historical ship. In 1925, it will be recalled, Congress authorized restoration of the *Constitution*, but appropriated no funds for the purpose.

To save the old ship it was decided to raise the money by private contributions through the sale of copies of the painting in Mr. Roosevelt's possession. Approximately 4,500,000 school children contributed. In all $725,000 was raised and now the *Constitution*, completely restored, is paying her respects to cities on the Pacific coast.

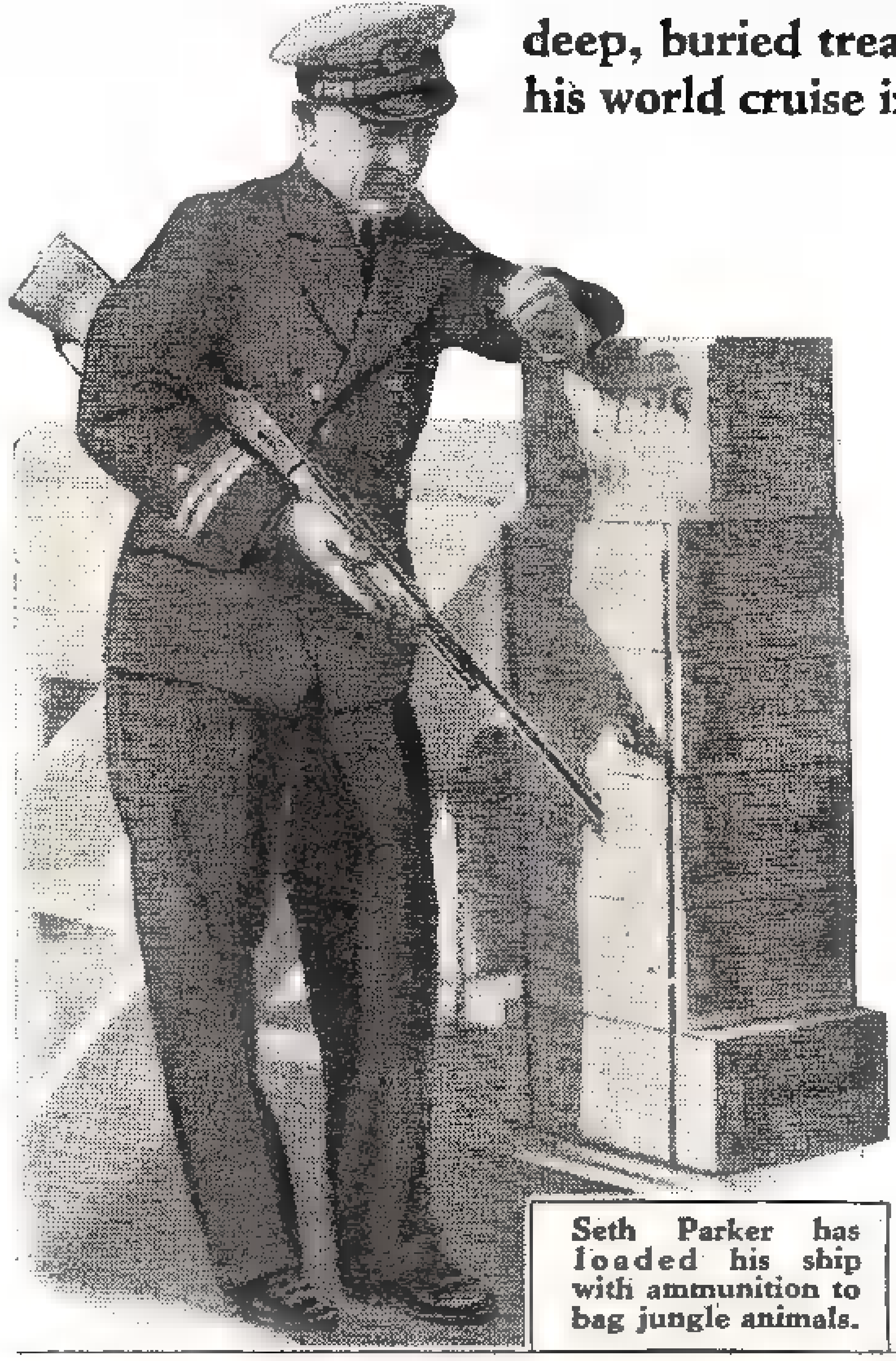
Another famous painting in this group shows the loss of the *Kearsarge*, well known Union man o'war of the Civil War. She was one of the earliest of Uncle Sam's steam war-sloops. The *Kearsarge* earned her place in American history by her victorious battle with the Confederate steamer, *Alabama*, off Cherbourg, France. The White House painting shows the famous ship some years later, sinking after being wrecked on Roncador Reef, in the Gulf of Mexico.

(Continued on page 121)

Seth Parker's Sunday Meeting Sails for World Adventure

Over the seven seas Seth Parker is seeking monsters of the deep, buried treasure and wild beasts. Here is the story of his world cruise in a windjammer, a boy's dream come true.

by ALFRED ALBELLI


Seth Parker has loaded his ship with ammunition to bag jungle animals.

YO-HO, me lads, yo-ho, by gosh! Here we be a-tryin' to take a chaw agin' the wind on the sleek schooner "Seth Parker" on a latitude "somewhere" en route around the world, with the famous radio star as the skipper and a rip-snortin', puddin'-headed, home-spun crew to do the chores.

Seth Parker, as ye all know, is neighbor Seth from old Jonesport, Maine, who used to have the Sunday night socials where the folks got together singing hymns and having a grand gab fest. The NBC radio station in great big New York eaves-dropped in on these meetings and city dandies got to snickering over goings-on in Jonesport. But Ma and Seth Parker, a cheerful, homey couple, put Jonesport on the map and did as much for their home state as Rudy Vallee and his stein song, by cracky!

Offers to Take School Chums

Back in the days when Seth Parker, whose name is Phillips Lord in real life, was in high school, he promised a few of his chums that if he ever became wealthy he would take them all on a cruise around the world in a real sailing schooner of bygone days.

Fame and money have come to Seth Parker through his homey Sunday night Yankee broadcasts. Phillips Lord is keeping his promise. After much searching, he found a fine old four masted schooner. He bought the ship and named it *Seth Parker*. Then he set out to get a crew who knew the difference between fore topgallant braces and flying jib booms, spanker sheets and main sheets; men who knew their sails and riggings.

Old salts who had sailed before the mast of windjammers were hard to find, but at last Seth Parker rounded up enough to man his schooner, only to find that rough going was still in the offing. The men could handle the ship, but they did not want the forecastle bunks, the mess table, and the salt pork of the old days.

Crew Wants Modern Luxuries

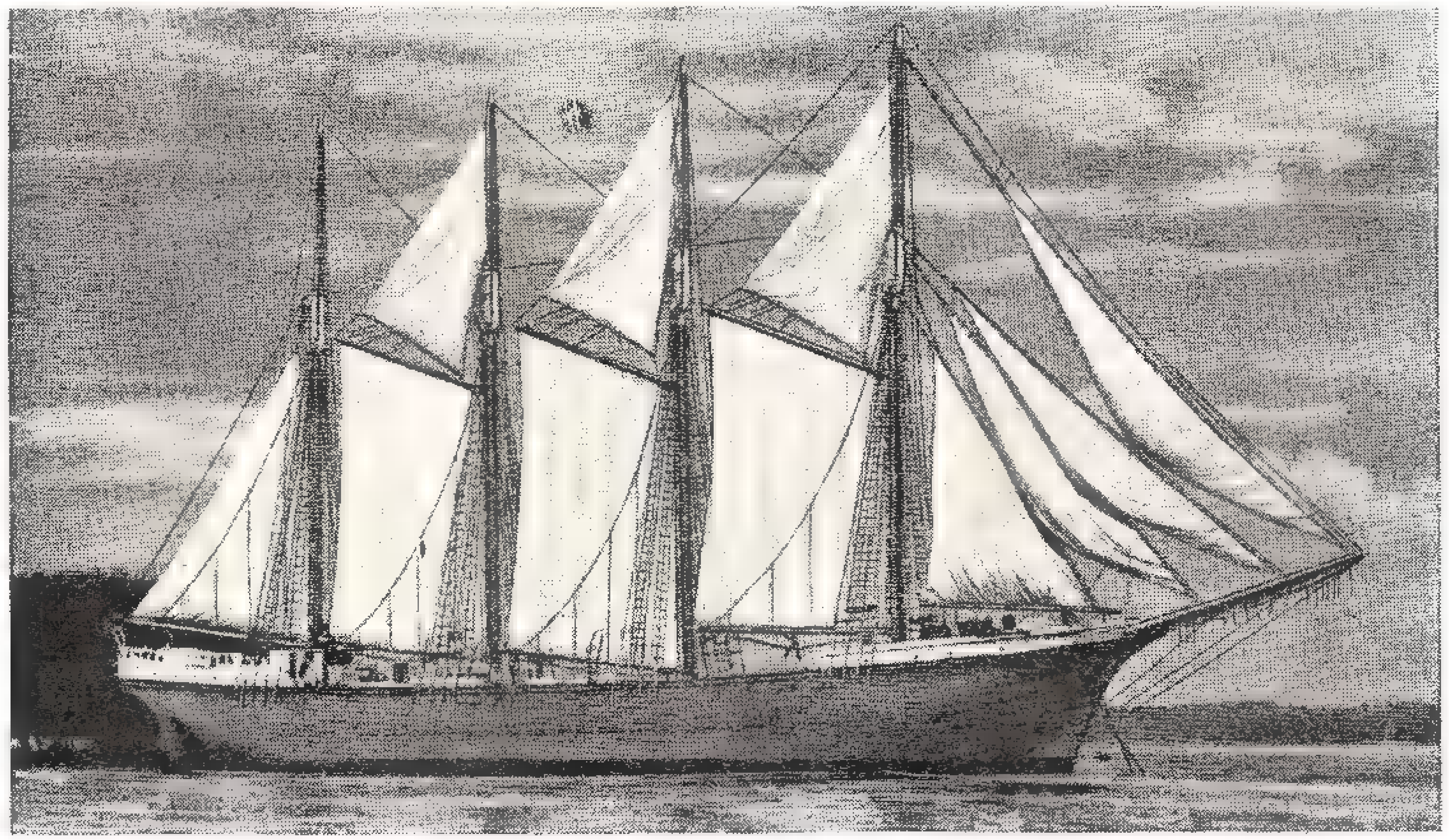
They wanted modern conveniences. Before he could set sail Seth Parker had to install an electric lighting system, electric refrigerator, air conditioning, and other up-to-date luxuries that appeared out of place in the old schooner.

The crew was satisfied and Phillips Lord notified his old pals he was ready to keep his promise. Here another hitch came into his plans. The friends notified him that their wives would not permit them to go.

Without his pals Seth Parker put out from Portland, Me., in his remodeled wind-

(Continued on page 134)

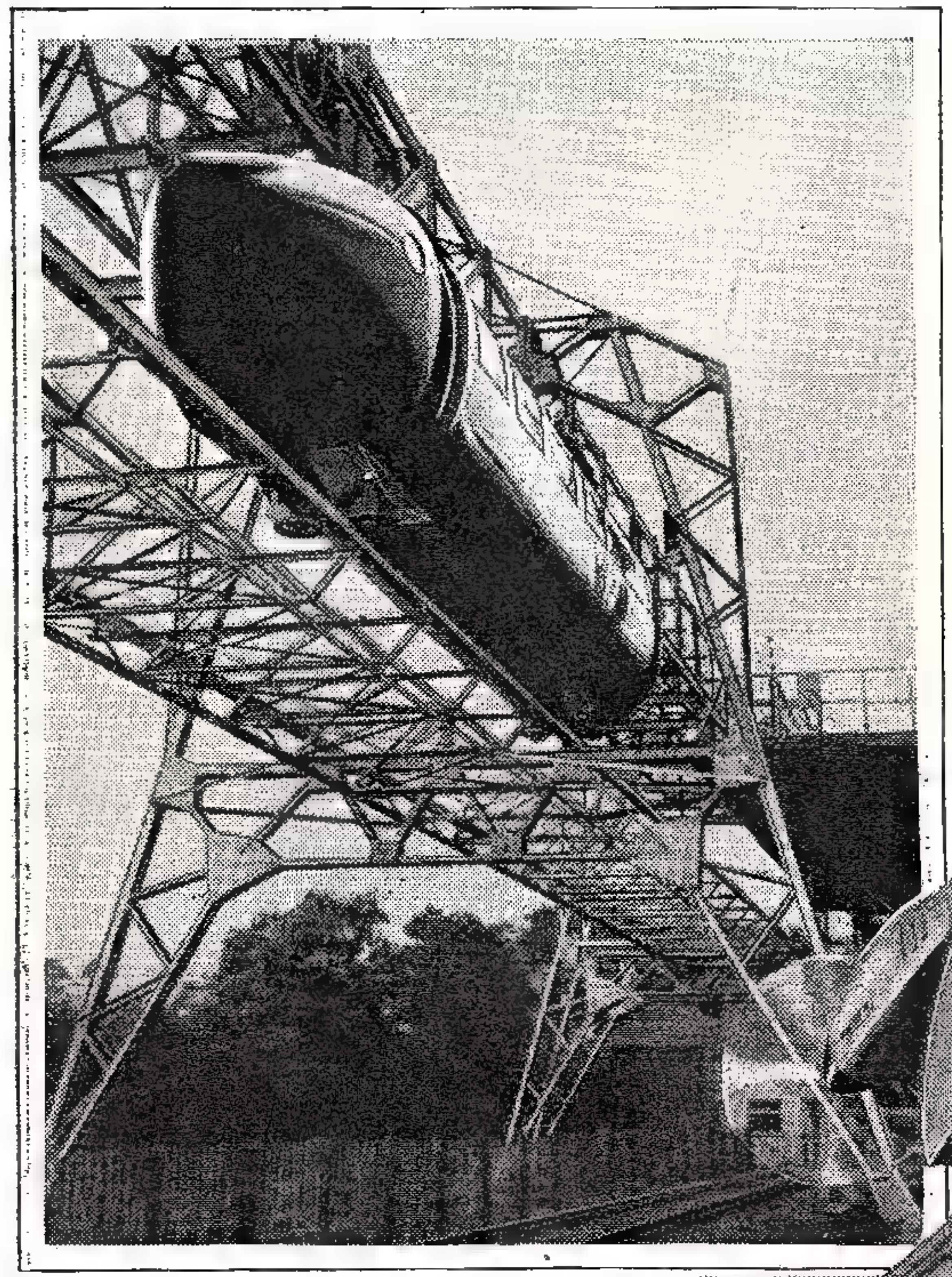
"Ma" and Seth Parker in character will enact their Sunday Yankee socials during the world cruise. Seth Parker's real name is Phillips Lord.


This four-masted schooner, "Seth Parker" is taking the noted radio star around the world on a cruise of adventure. The interior of this windjammer has been refurnished entirely with modern conveniences to satisfy the ship's crew.

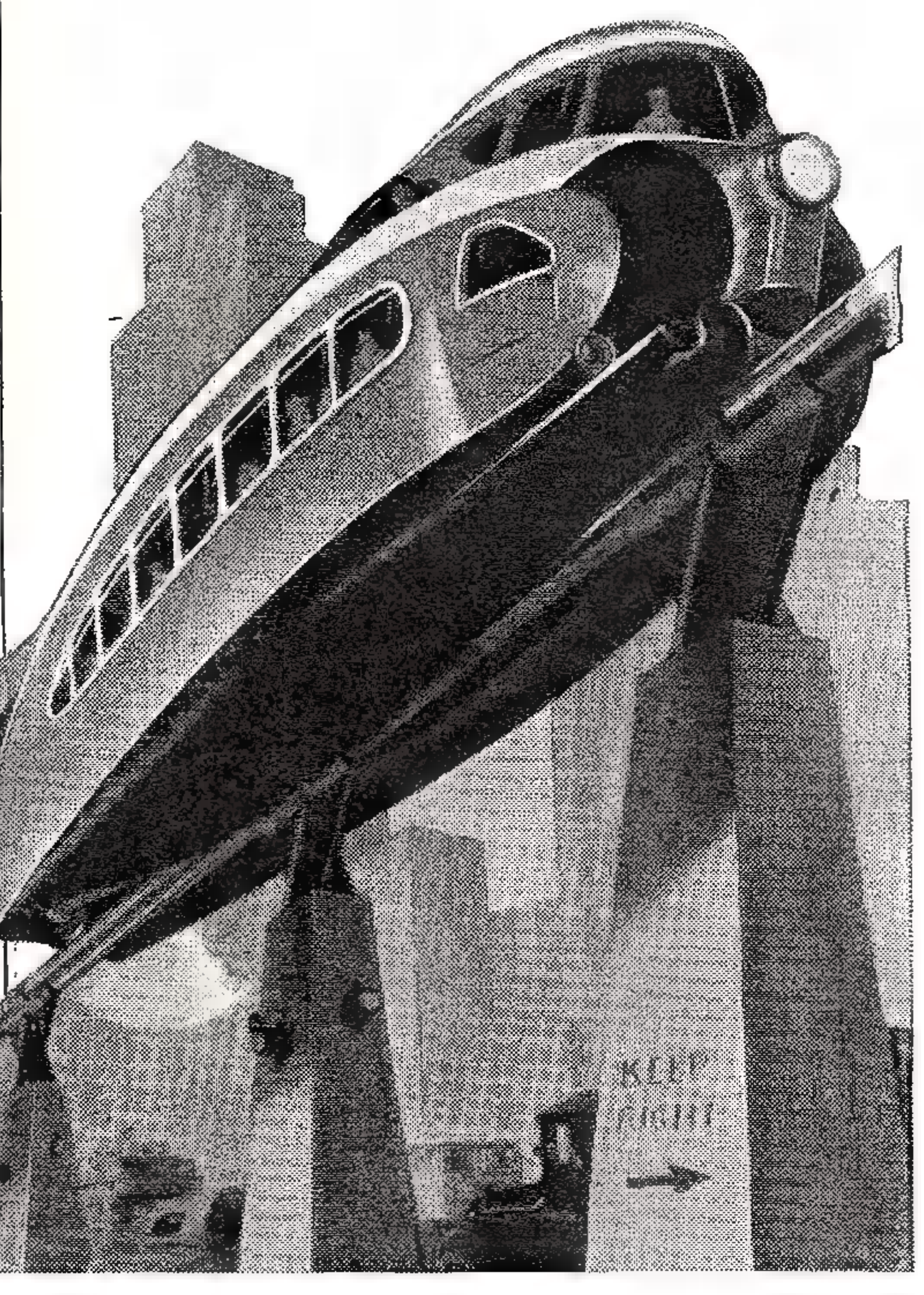
The old fashioned New England parlor that forms the background for Seth Parker's famous hymn and gossip socials. The entire cast has been taken on the world cruise to continue the weekly broadcasts by short wave from the ship.

Gyroscope Monorail Car to Travel 300 Miles an Hour

This German monorail will revolutionize rail transportation. At 300 miles per hour it will meet the challenge of the air transport lines.



The monorail car above has just been developed in England to provide fast transportation as a substitute for street car systems. Driven by propellers fore and aft this monorail developed a speed of 100 miles an hour in a demonstration near Glasgow. Guide rail prevents side sway.



Engineer Buchardt's improvement over the English monorail is shown above. For street transport systems large steel structures would be unnecessary. Gyroscopes would eliminate a guide rail to stop side sway. Greater speed is possible.

RAILROADS may challenge the increased popularity of air travel by developing a superspeed monorail car. Balanced by gyroscope and controlled by radio, the gyroscope monorail would be capable of more than 300 miles an hour, its inventor claims.

The gyroscope, not a modern invention, has only recently been applied to transportation. It steadies ships in storm tossed seas. It aids in the automatic control of airplanes in flight.

Applied to rail transportation, the gyroscope will permit much greater speed without sacrificing safety. In fact, Raymond C. Buchardt, engineer of the Telefunken company, of Germany, who designed the gyroscope monorail, claims his superspeed car provides greater safety than is now possible.

Car Stands Upright on Monorail

Buchardt's monorail has all the latest developments in streamlining and makes use of airplane features to guide the car on its single rail. The gyroscope monorail stands upright on its single rail, while present monorails are suspended from the rail.

The gyroscopes are used to balance the car on this single rail. They do away with the side sway that would be present were great speeds attempted with the suspended monorail.

Radio Will Replace Block Signals

"Because of the terrific speed of more than 300 miles an hour, the ordinary block signal will be impossible for the trans-continental monorail," said Mr. Buchardt. "Signals would not be visible and in fog, rain or smoke the vision of the pilot would be entirely obscured.

"To meet this difficulty I propose to use the radio to transmit signals and orders to the pilot just as transport planes are now controlled. Radio messages from a dispatcher's office would tell the pilot when to slow up and would warn him of any dangers ahead."

The enormous air pressure created by the great speed would throw an ordinary car from the rail. Buchardt has solved this problem by designing a long, sloping curve on either side of the car, which he calls a "wind catcher." The air pressing against this "wind catcher" would hold the car on the rail.

In his experiments with his invention, Buchardt found that the monorail would have trouble taking curves. The car took the curve perfectly, but the centrifugal force nearly threw it off the rail after completing the curve.

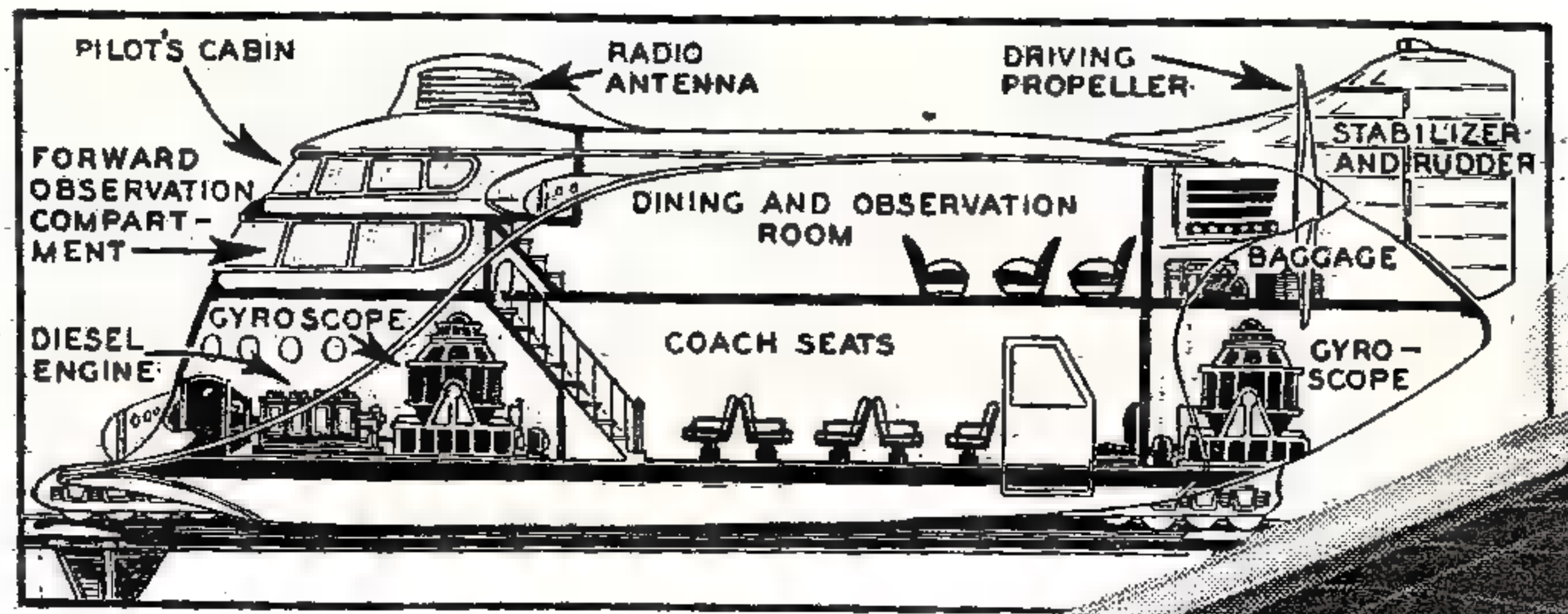
For that reason stabilizing fins were placed at the front and rear of the car along with a large rudder. The forward fin also houses the radio antenna.

The gyroscope car is driven by two large propellers at either side of the rear end of the car. One gyroscope would be housed in the forward end of the car and the other in a rear compartment. Power would be supplied by Diesel engines.

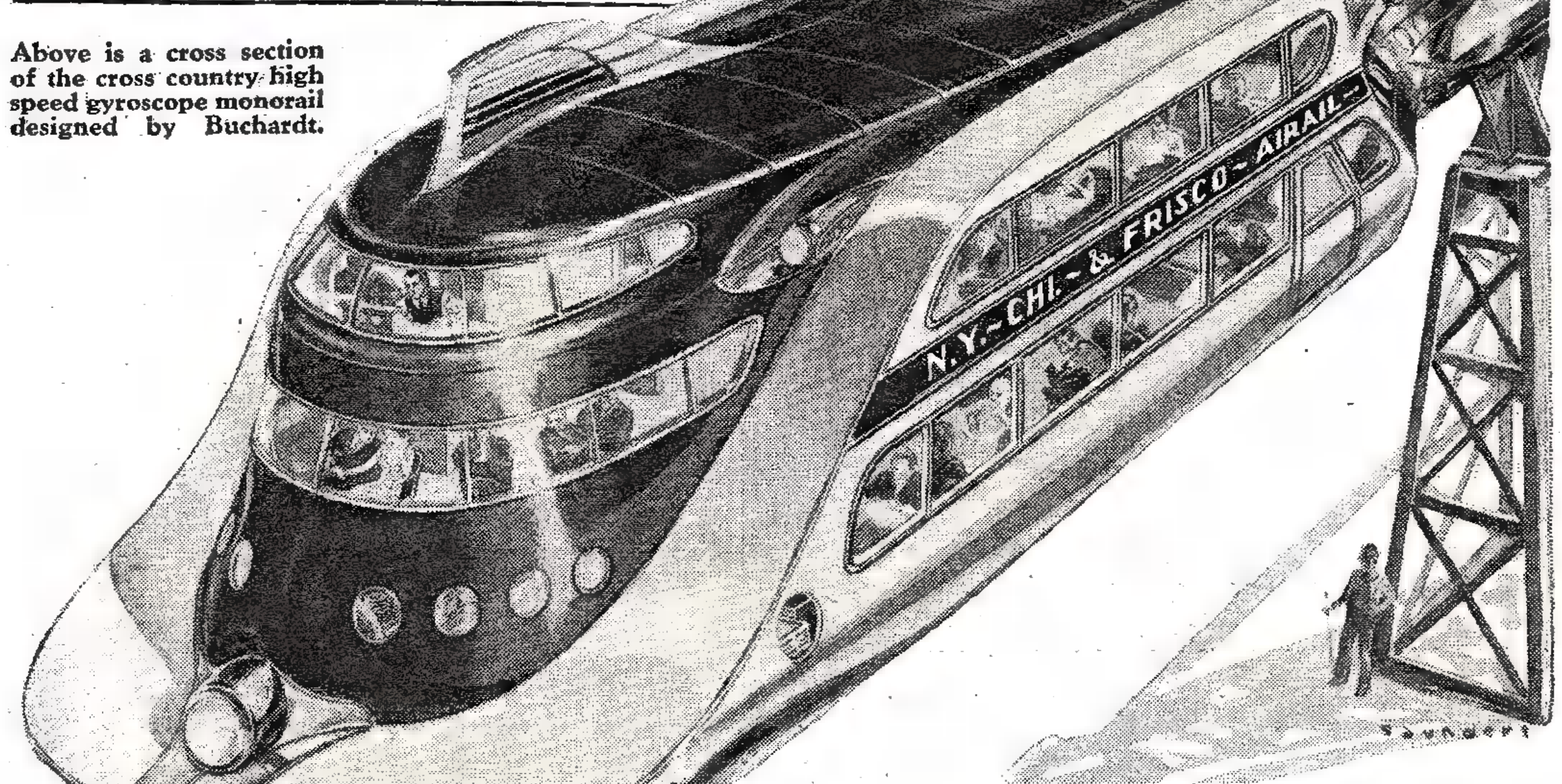
The rail used would be round and the wheels curved in such a way as to form a ball link.

The traction system type of monorail would be much smaller than the car used in cross country runs. The latter would be a double-decked car with the pilot housed in a third deck forward.

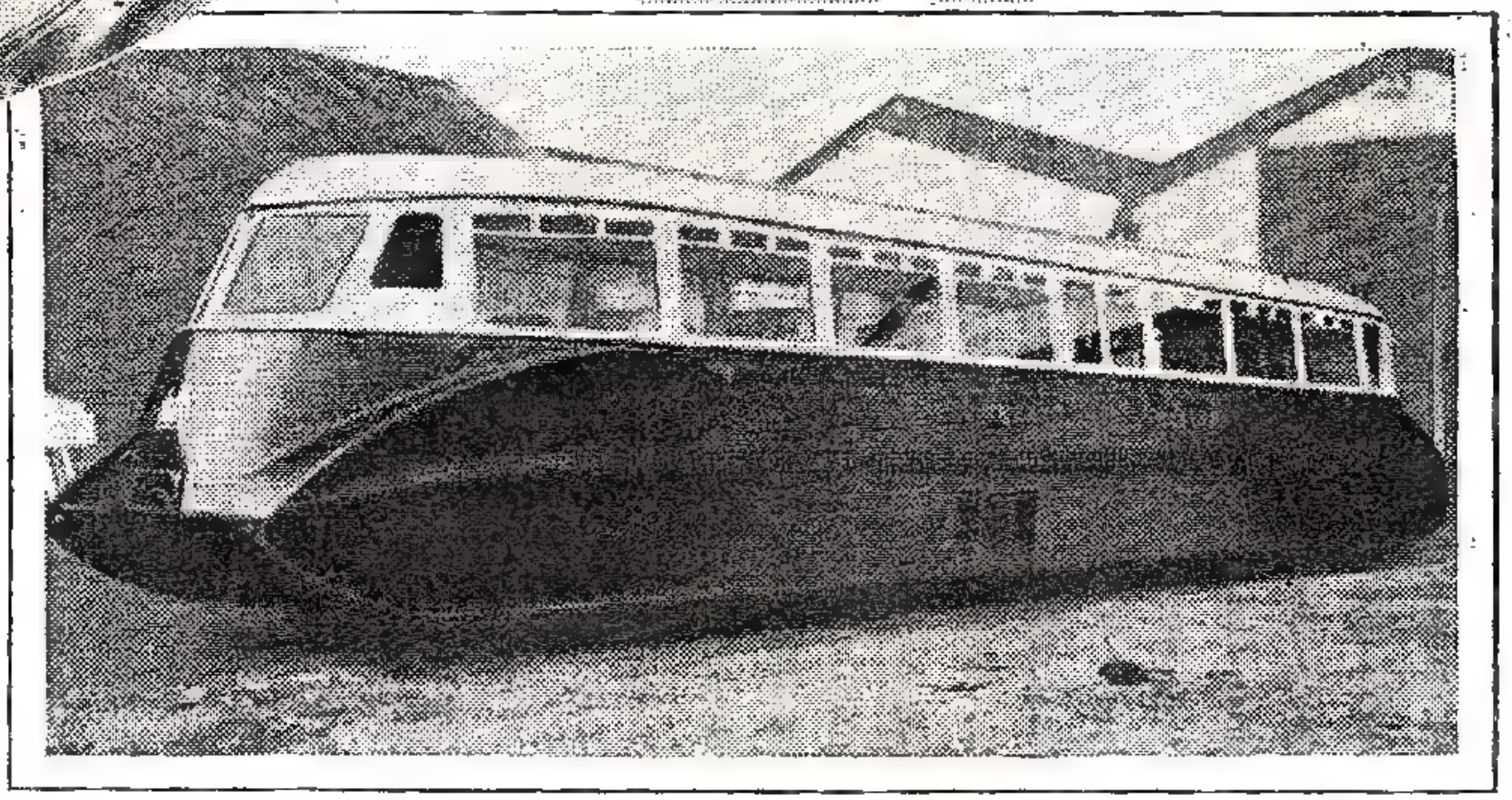
The trans-continental type would carry approximately 100 passengers.



Above is a cross section of the cross country high speed gyroscope monorail designed by Buchardt.



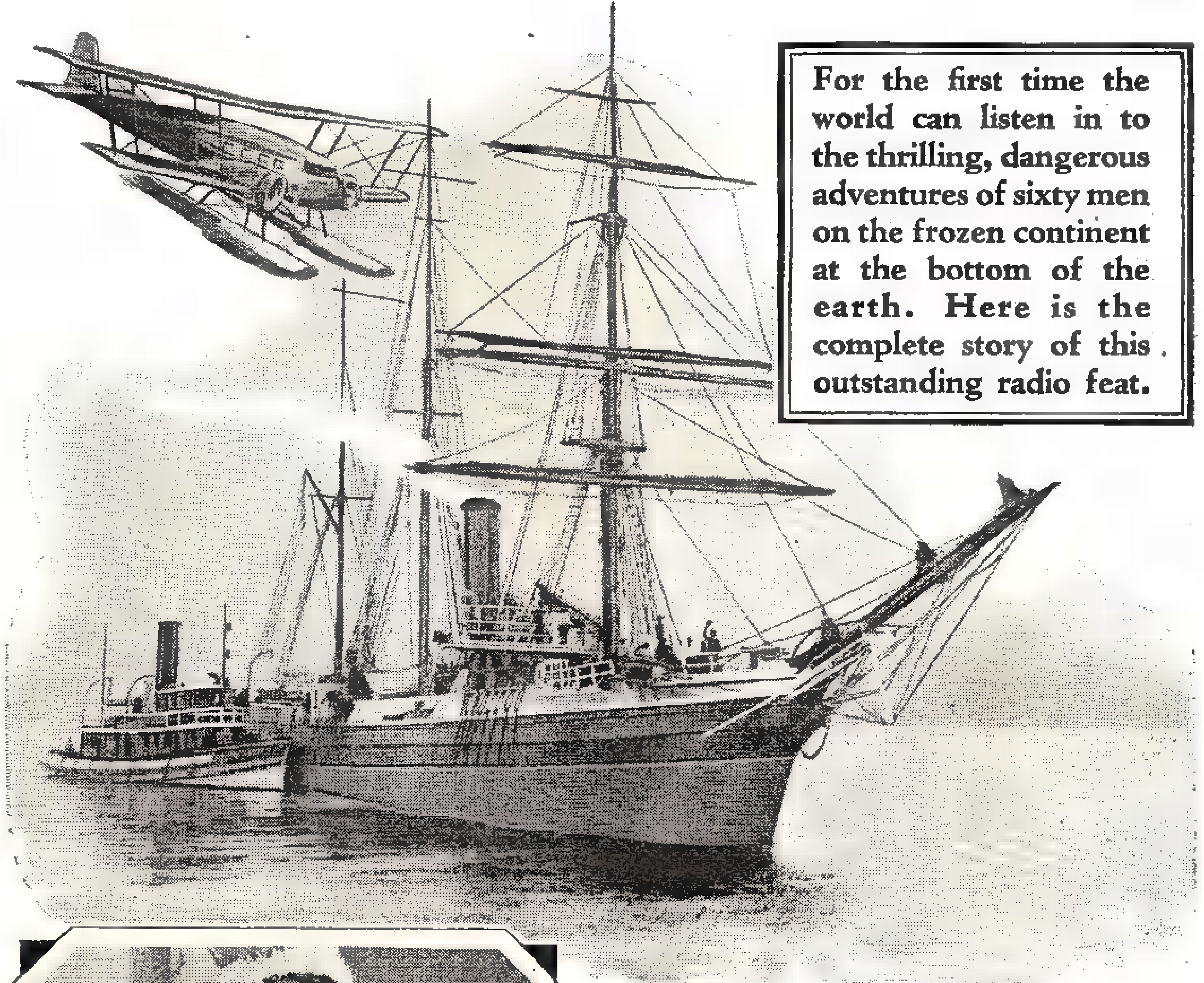
The 300-mile-an-hour gyroscope monorail is shown in the artist's drawing above. The long forward sloping planes hold the car to the rail. Radio signals would guide pilot.



This latest railroad car design follows the streamlining used on the gyroscope monorail. This English rail car attained a maximum speed of 60 miles per hour.

SOUTH POLE Broadcasting —Admiral BYRD Speaking!

For the first time the world can listen in to the thrilling, dangerous adventures of sixty men on the frozen continent at the bottom of the earth. Here is the complete story of this outstanding radio feat.



The ice breaker, "Bear of Oakland" (above), will be the first of Byrd's ships to reach Little America, where the expedition's largest radio station will be established.

Admiral Byrd, bundled in furs, will broadcast his flight over the South Pole. The rifle will be part of emergency equipment carried in case of forced landings on barren Antarctica.

HISTORY, adventure, thrilling exploration—all these will be enacted at the bottom of the earth when Admiral Richard E. Byrd makes a double conquest of the air.

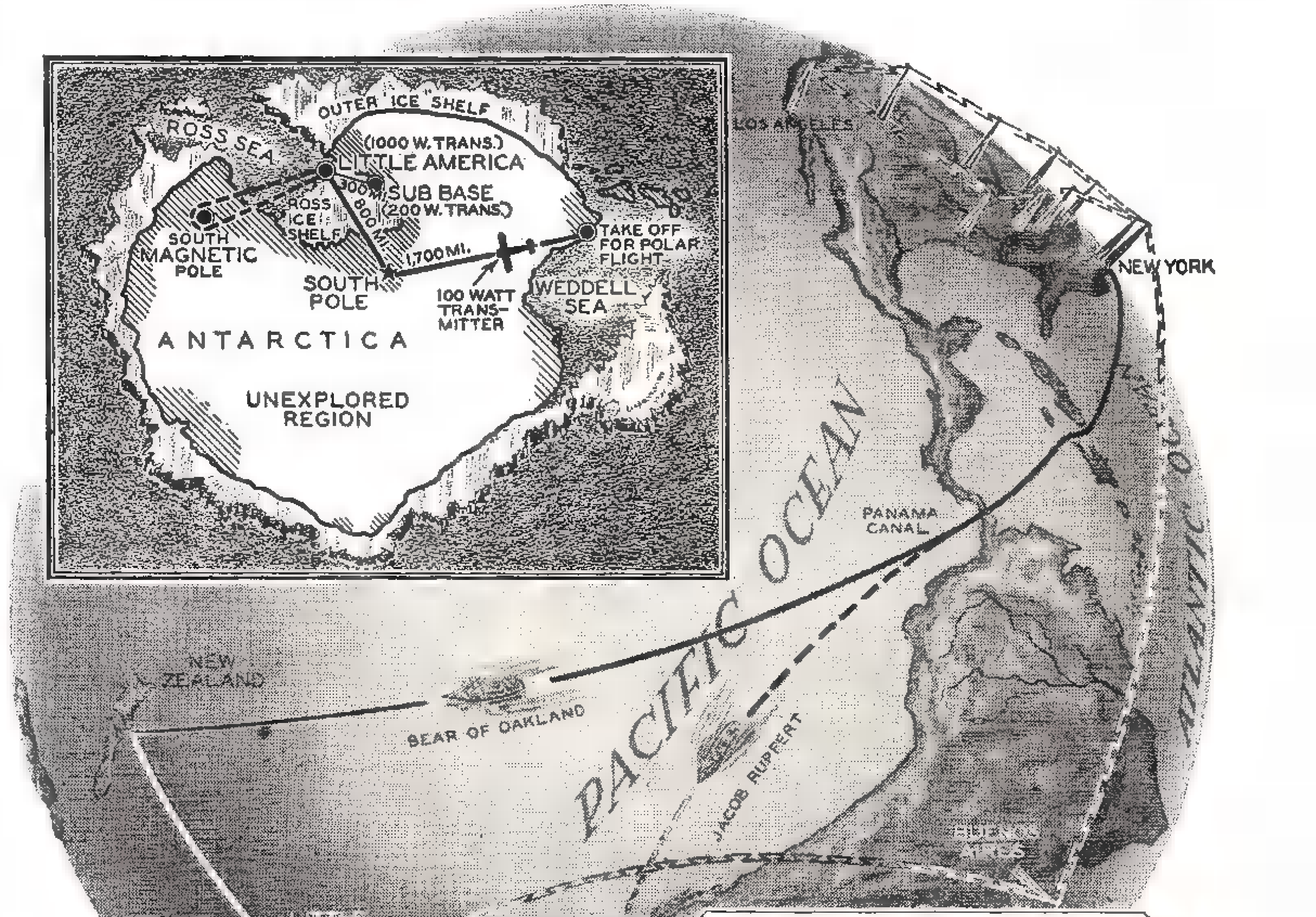
Over the great sweep of pack ice, the lofty frozen peaks of Antarctica, a giant airplane will roar through a leaden, forbidding sky on another major epoch in the field of aviation.

Rescues to Be Broadcast

In the cabin of that plane, a band of daring men, every nerve tense with the excitement of hazardous adventure, will bring to the rest of the world, seated cozily in the comfort of home, a vivid description of the bleak icy wastes of the polar regions.

For the first time in history the South Pole will go on the air in regular radio broadcasting and the world will hear the words: "This is Admiral Byrd speaking to you from the South Pole."

His airplane's little 100-watt station will send through the ether a program more exciting than the greatest football game, more thrilling than the pulse-stirring race of the finest thoroughbreds of the turf.

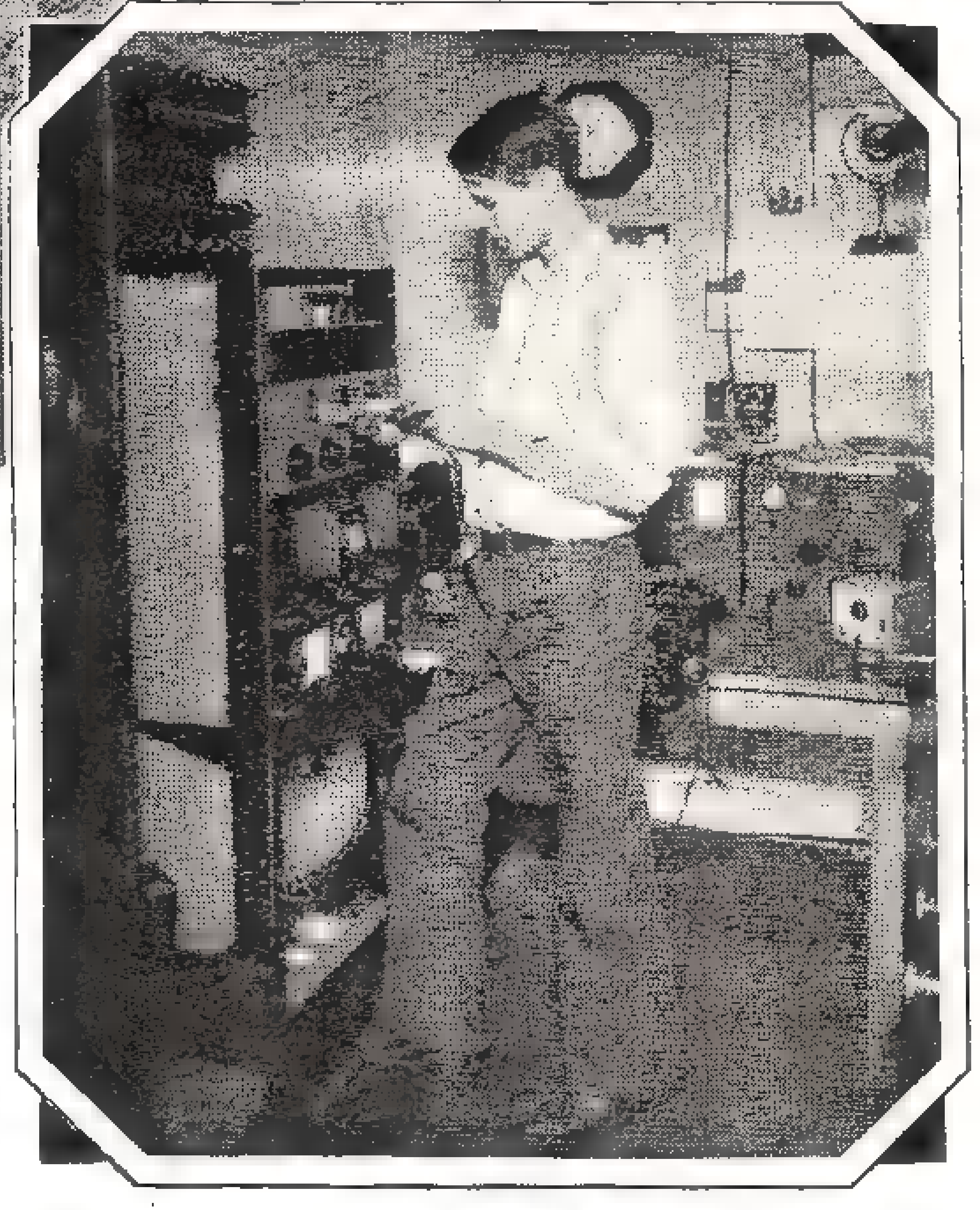


OUTER ICE SHELF
ROSS SEA
(1000 W. TRANS.)
LITTLE AMERICA
300 MI.
SUB BASE
(200 W. TRANS.)
ROSS ICE SHELF
800 MI.
SOUTH MAGNETIC POLE
SOUTH POLE
1,700 MI.
TAKE OFF FOR POLAR FLIGHT
100 WATT TRANSMITTER
WEDDELL SEA
ANTARCTICA
UNEXPLORED REGION
LOS ANGELES
NEW YORK
PANAMA CANAL
PACIFIC OCEAN
ATLANTIC OCEAN
NEW ZEALAND
BEAR OF OAKLAND
JACOB RUPPERT
BUENOS AIRES
LITTLE AMERICA
SOUTH MAGNETIC POLE
SOUTH POLE
WEDDELL SEA
ANTARCTICA

Little America will broadcast 10,000 miles to New York with a relay station at Buenos Aires, as shown in the above map. The "Jacob Ruppert" will take Byrd to Weddell Sea for takeoff on polar flight, later flying to South Magnetic pole. Only shaded areas on inset map have been explored.

Should that Giant Curtiss Condor transport plane be forced down and Byrd and his men face death in the unexplored reaches of the great South Pole continent, radio will carry over the air every detail of the heroic rescue attempts.

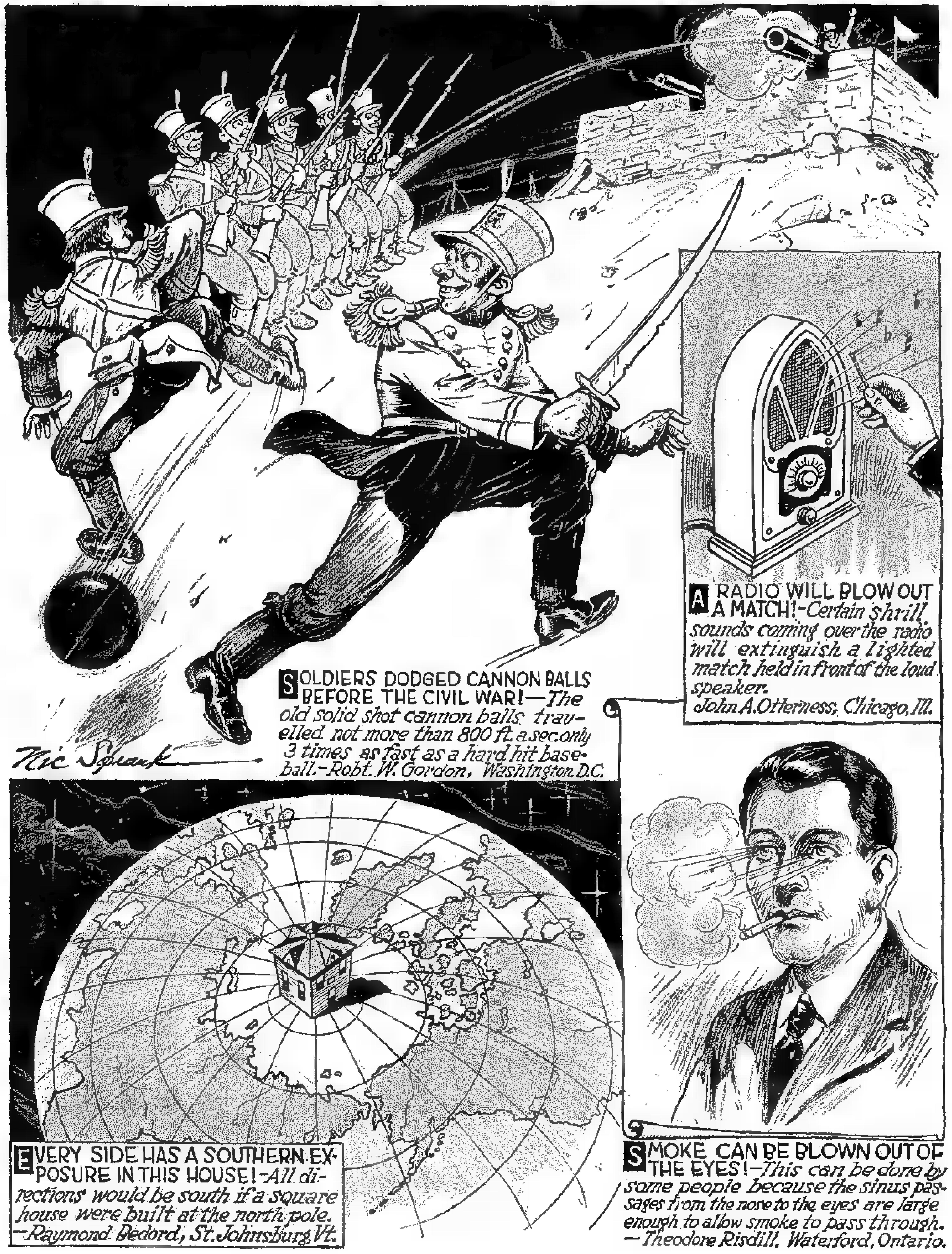
Each of the sledge parties, pulled by the expedition's 150 Canadian huskies, will carry a radio transmitter and receiver when it sets out across the Ross Ice Shelf from the base at Little America on the Bay of Whales. Every one of Byrd's four other airplanes, including an autogyro, will carry radio equipment when it takes to



John Dyer, shown in the control room of station KJTY aboard the "Jacob Ruppert," will be technical engineer for the Columbia Broadcasting Company in Antarctica. This 1,000-watt transmitter will be installed at Little America to broadcast Saturday night programs of the Byrd expedition through Buenos Aires to WABC in New York.

Something New under the Sun in Oddities of Science

by NIC SPRANK



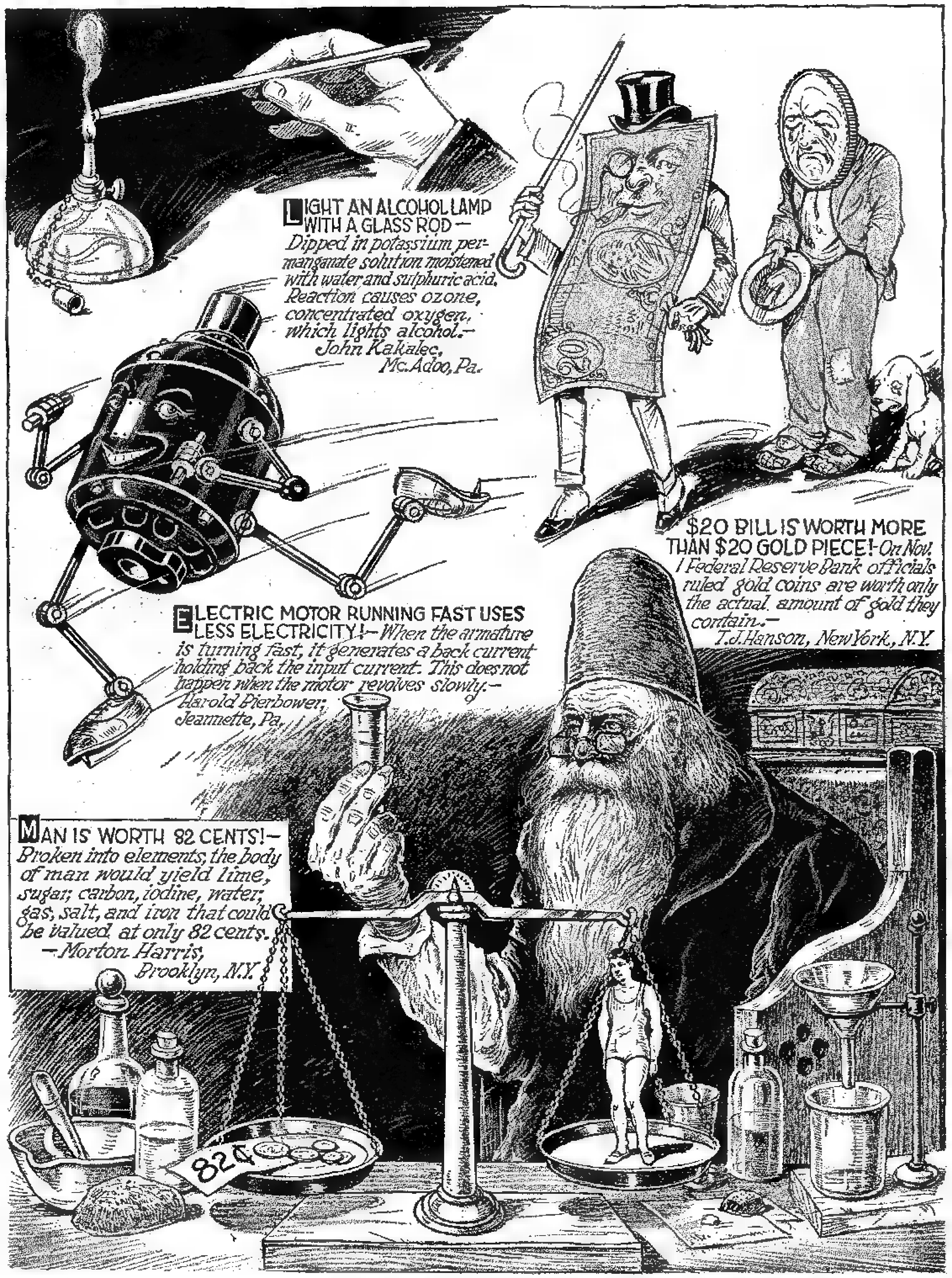
SOLDIERS DODGED CANNON BALLS BEFORE THE CIVIL WAR!—*The old solid shot cannon balls travelled not more than 800 ft. a sec. only 3 times as fast as a hard hit baseball.*—Robt. W. Gordon, Washington, D.C.

A RADIO WILL BLOW OUT A MATCH!—*Certain shrill sounds coming over the radio will extinguish a lighted match held in front of the loud speaker.*
John A. Otterness, Chicago, Ill.

EVERY SIDE HAS A SOUTHERN EXPOSURE IN THIS HOUSE!—*All directions would be south if a square house were built at the north pole.*
—Raymond Bedord, St. Johnsburg, Vt.

SMOKE CAN BE BLOWN OUT OF THE EYES!—*This can be done by some people because the sinus passages from the nose to the eyes are large enough to allow smoke to pass through.*
—Theodore Risdill, Waterford, Ontario.

On the surface many odd facts that seem to defy natural law are easily understandable when the physical conditions back of the phenomena are known. Here are two pages illustrating facts that appear fallacious at a casual glance, but which are quite natural when all conditions surrounding them are considered. Remember Nic Sprank pays One Dollar for all scientific oddities acceptable to Modern Mechanix editors. What have you to offer for Nic Sprank's pages of oddities?



LIGHT AN ALCOHOL LAMP WITH A GLASS ROD—*Dipped in potassium permanganate solution moistened with water and sulphuric acid. Reaction causes ozone, concentrated oxygen, which lights alcohol.*—
John Kakalec,
Mc.Adoo, Pa.

$20 BILL IS WORTH MORE THAN $20 GOLD PIECE!—*On Nov. 1 Federal Reserve Bank officials ruled gold coins are worth only the actual amount of gold they contain.*—
T. J. Hanson, New York, N.Y.

ELECTRIC MOTOR RUNNING FAST USES LESS ELECTRICITY!—*When the armature is turning fast, it generates a back current holding back the input current. This does not happen when the motor revolves slowly.*—
Harold Bierbower,
Jeannette, Pa.

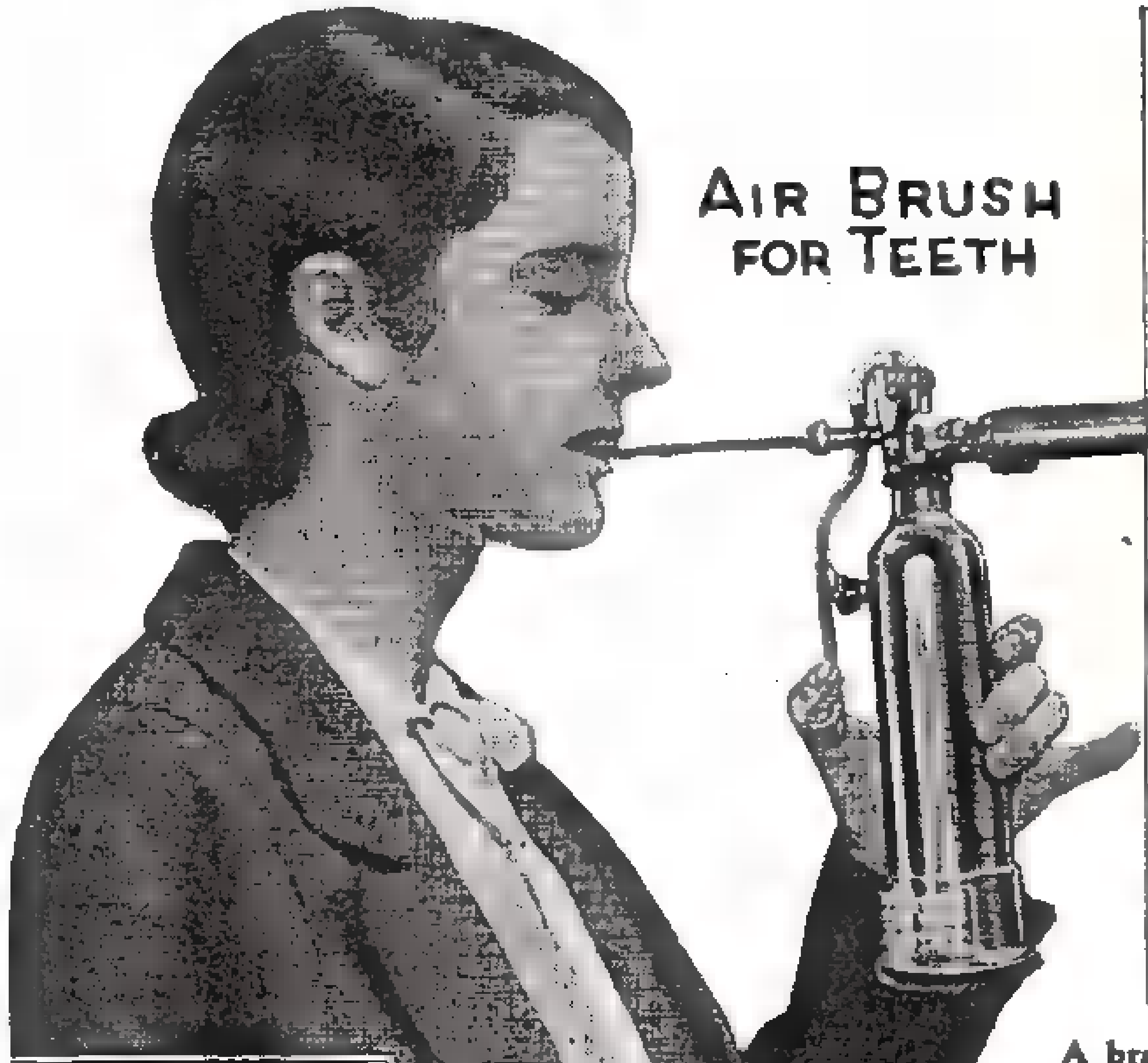
MAN IS WORTH 82 CENTS!—*Broken into elements, the body of man would yield lime, sugar, carbon, iodine, water, gas, salt, and iron that could be valued at only 82 cents.*
—Morton Harris,
Brooklyn, N.Y.

These strange facts of science may bring to mind some of the things which on every hand refute some of the accepted notions about nature. ONE DOLLAR will be paid you by Nic Sprank for every Oddity he considers good enough for these pages. Try your luck! Send in something new—don't re-hash the obvious, and your chances of getting a dollar bill are as good as the next man's. Address Nic Sprank, care Modern Mechanix, 529 South 7th Street, Minneapolis, Minn.

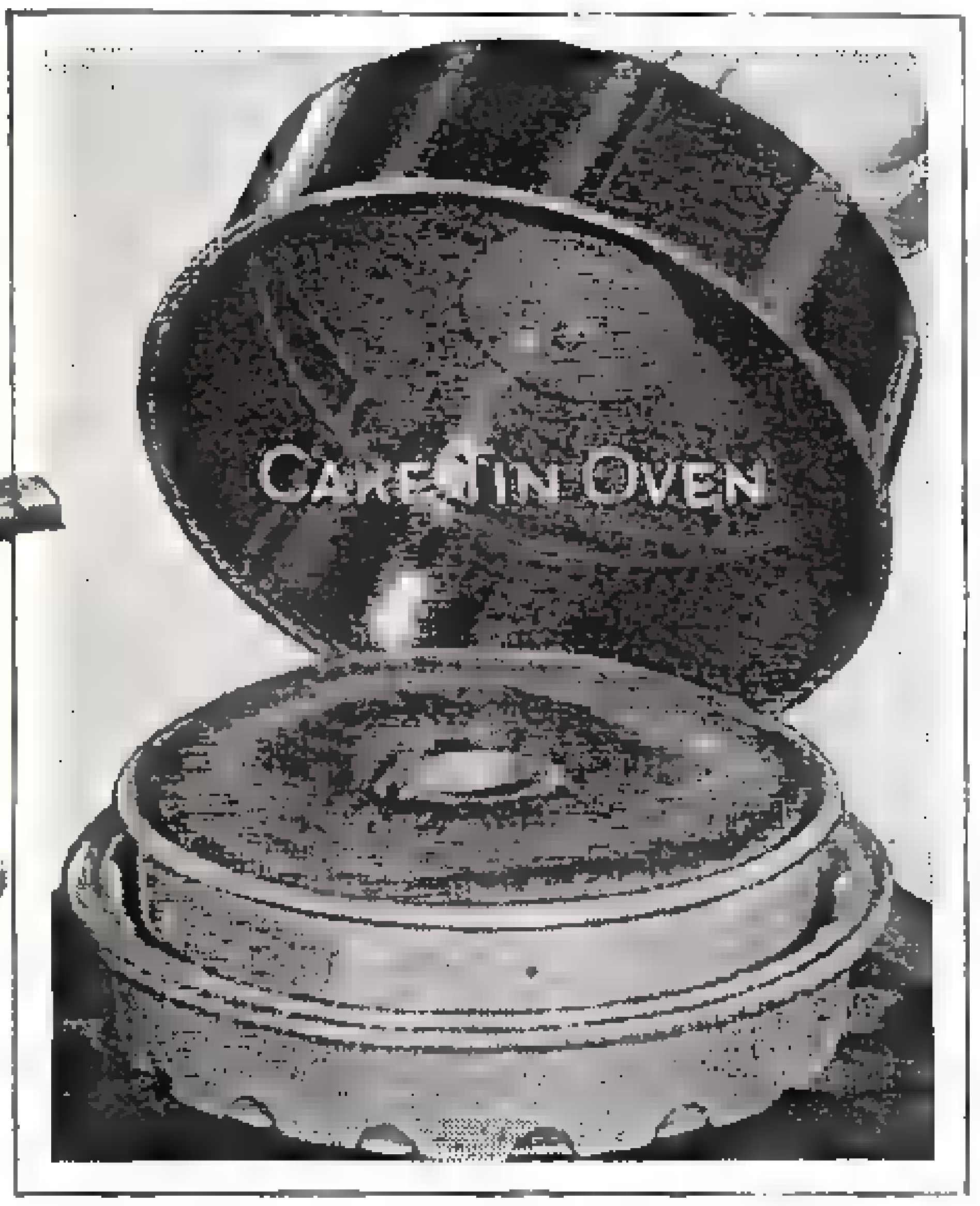
Stove Top Oven Among New HOUSEKEEPING *Ideas*

"What won't they think of next?" the surprised householder asks as a compressed air toothbrush is added to the month's discoveries.

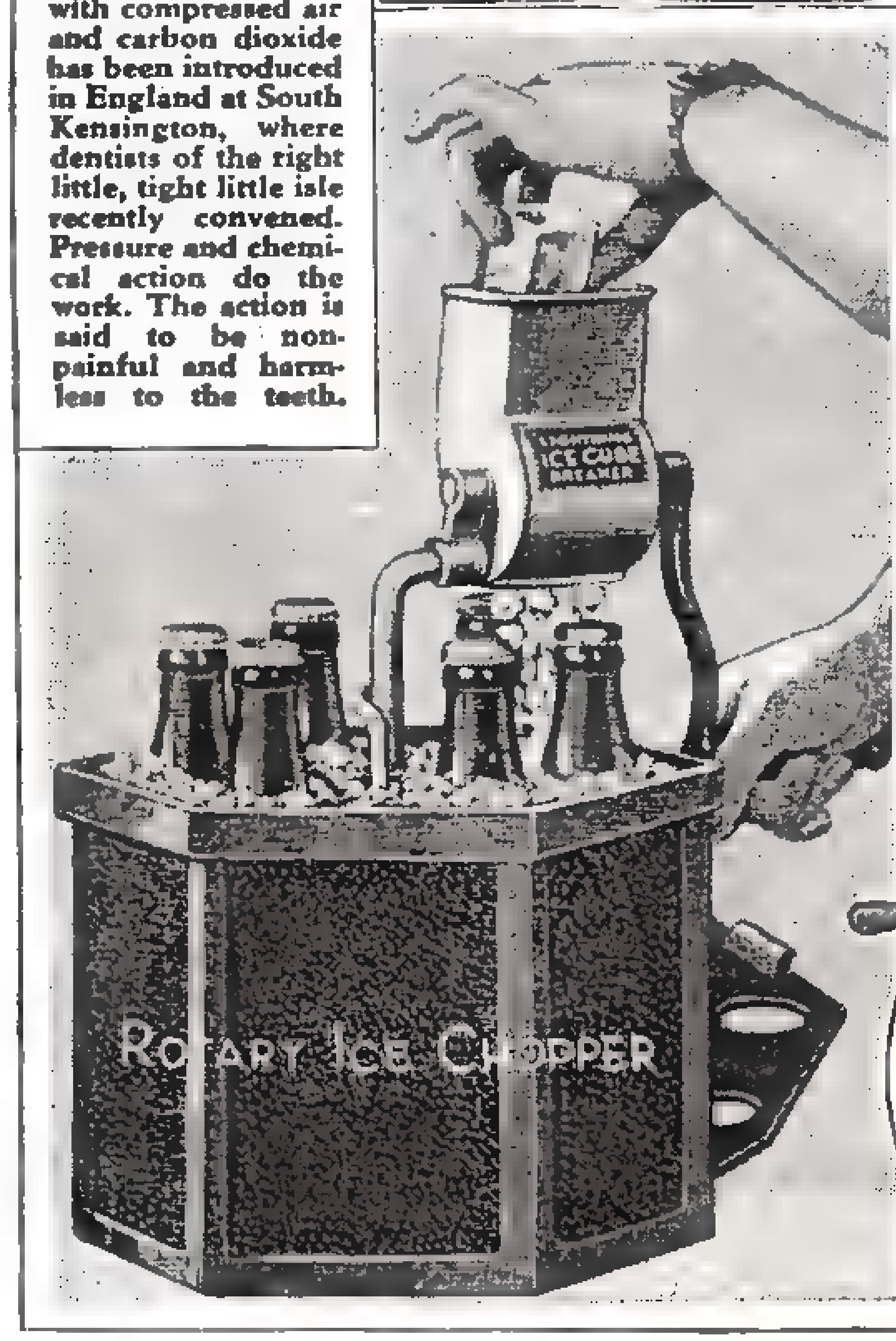
Waffled steaks, oxygen beauty baths and serve-all scissors are among the latest gadgets introduced to the home.

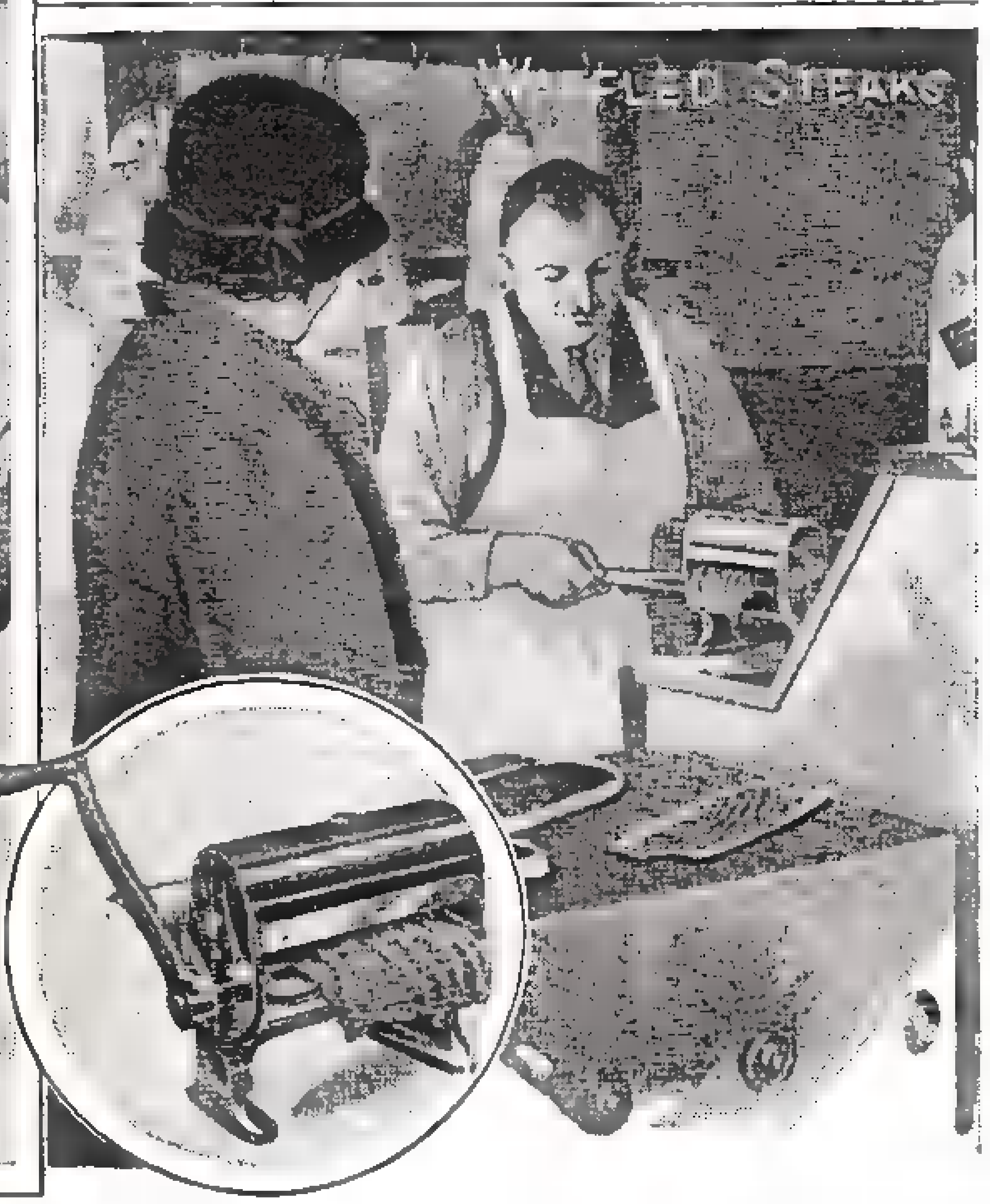


An air gun which sprays the teeth with compressed air and carbon dioxide has been introduced in England at South Kensington, where dentists of the right little, tight little isle recently convened. Pressure and chemical action do the work. The action is said to be non-painful and harmless to the teeth.

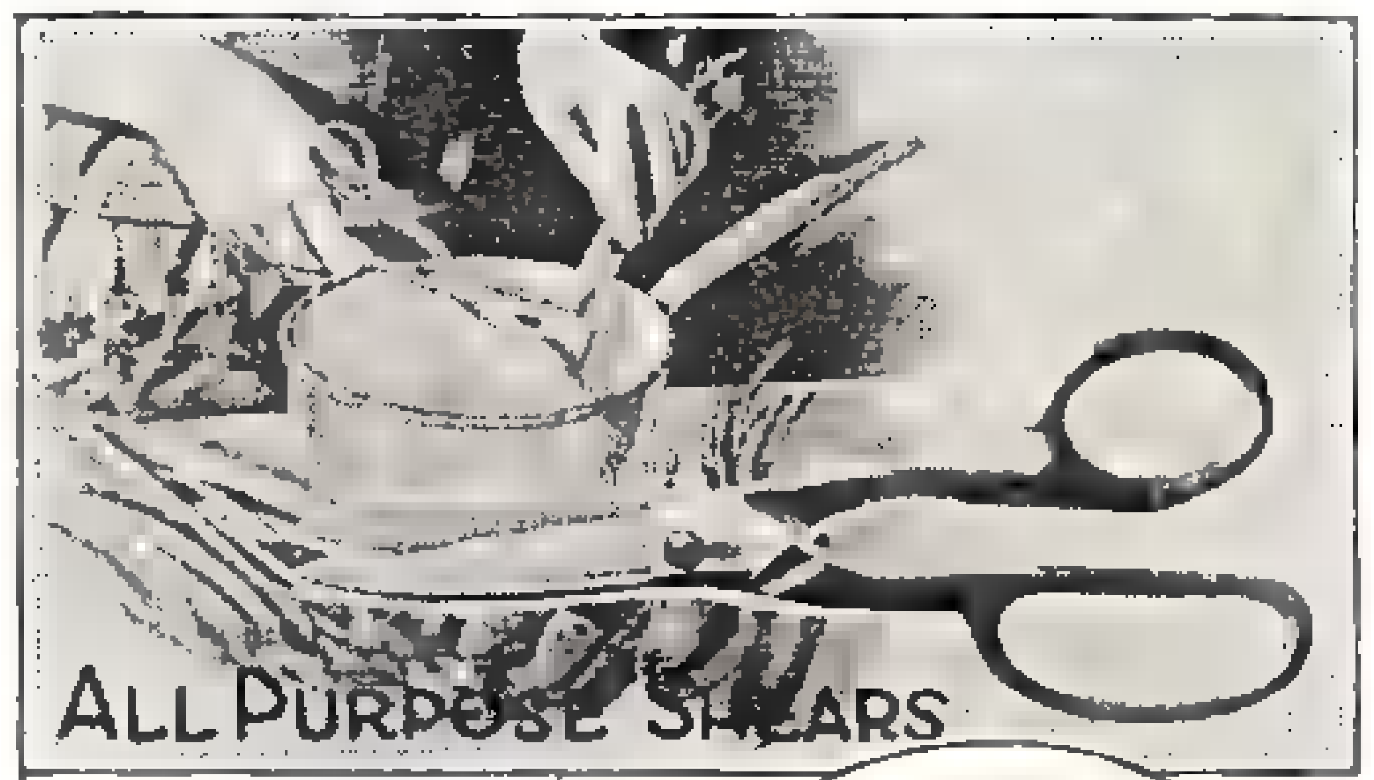


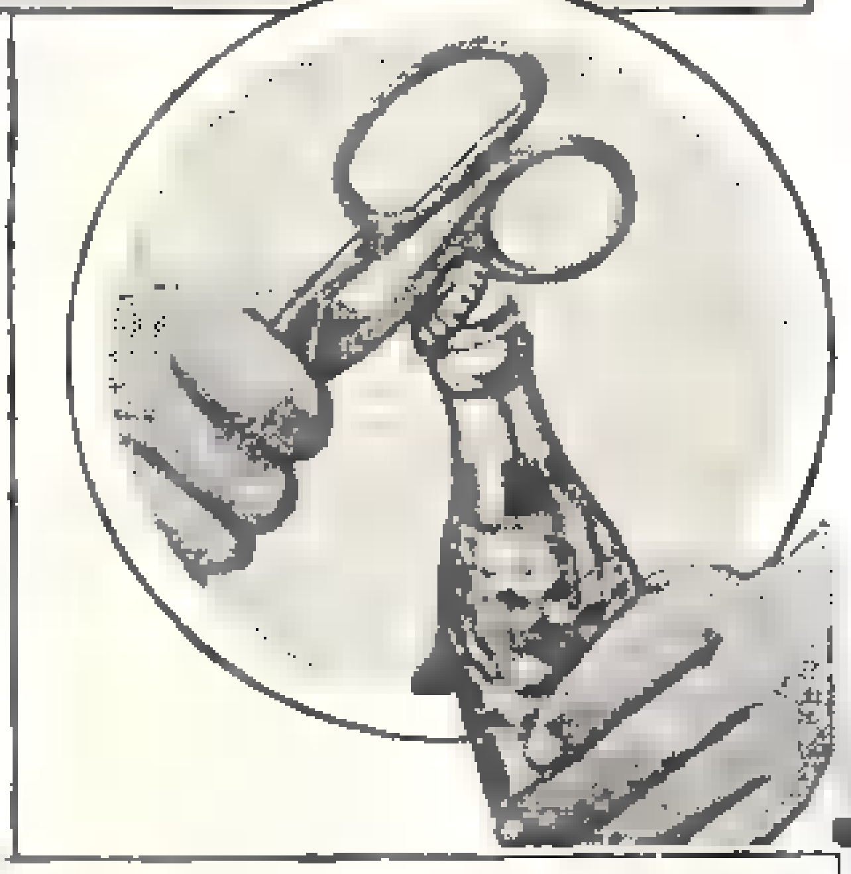
A brand new idea in ovens is one which fits the individual cake tin and can be used on top of the stove instead of in the regular big oven which takes a lot of gas to run. It has a funnel shaped opening in the base of the bake pot which gives even distribution of heat. Being sealed it preserves the moisture of the object which is baking and therefore does a better bake job.

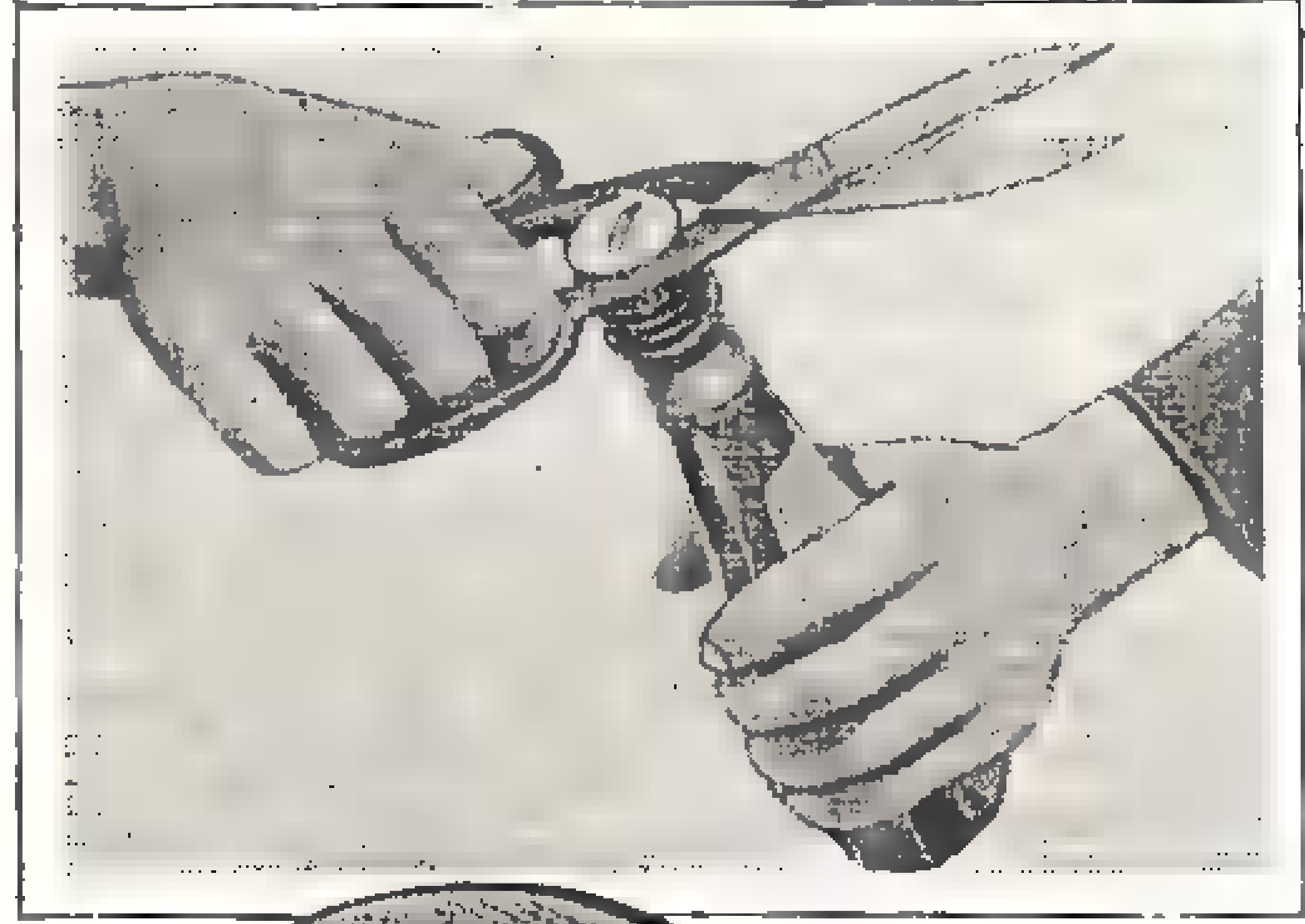




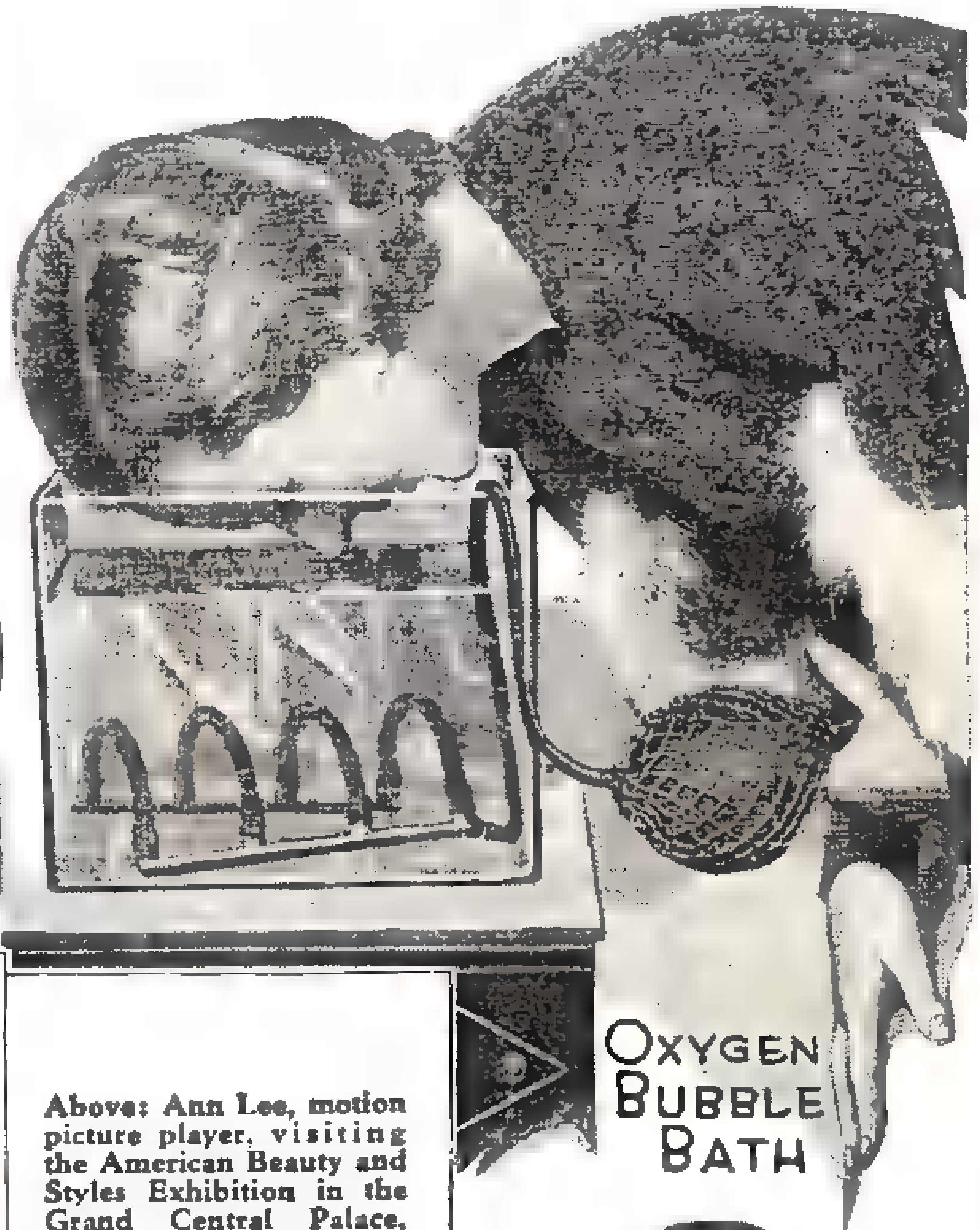
For cooling bottled beverages a convenient unit is now available which stores the beer in a hexagonal tub over which is a rotary ice chopper which shaves ice cubes into chopped ice. The steak waffler shown at the right will make the toughest flank steak taste like tenderloin. The rotary knives break the fibers up into units that cook easily.





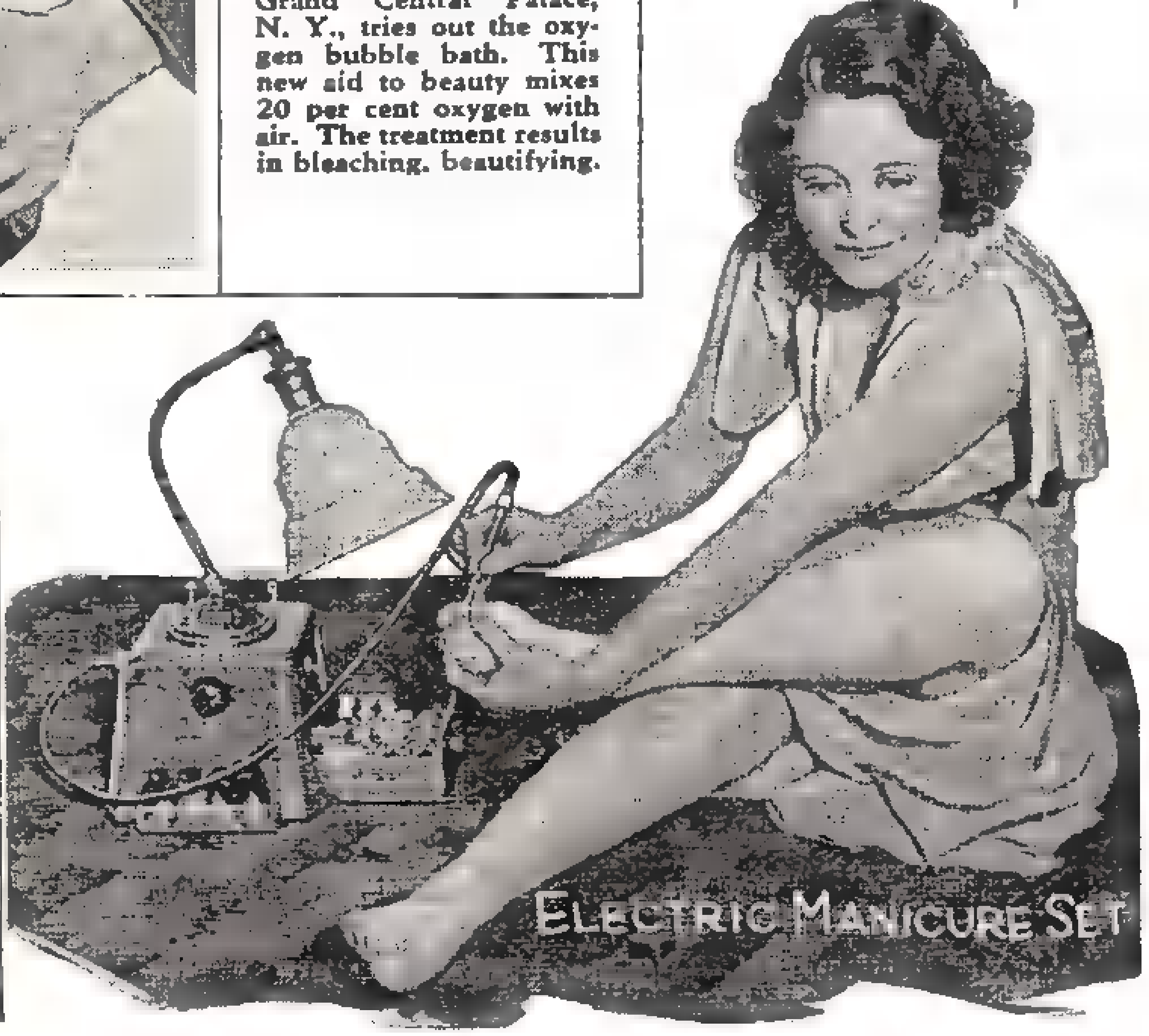


These all-purpose kitchen scissors have been recently introduced to serve many purposes in the kitchen. Vegetable slicer, bottle opener and cap puller are included in its many uses.



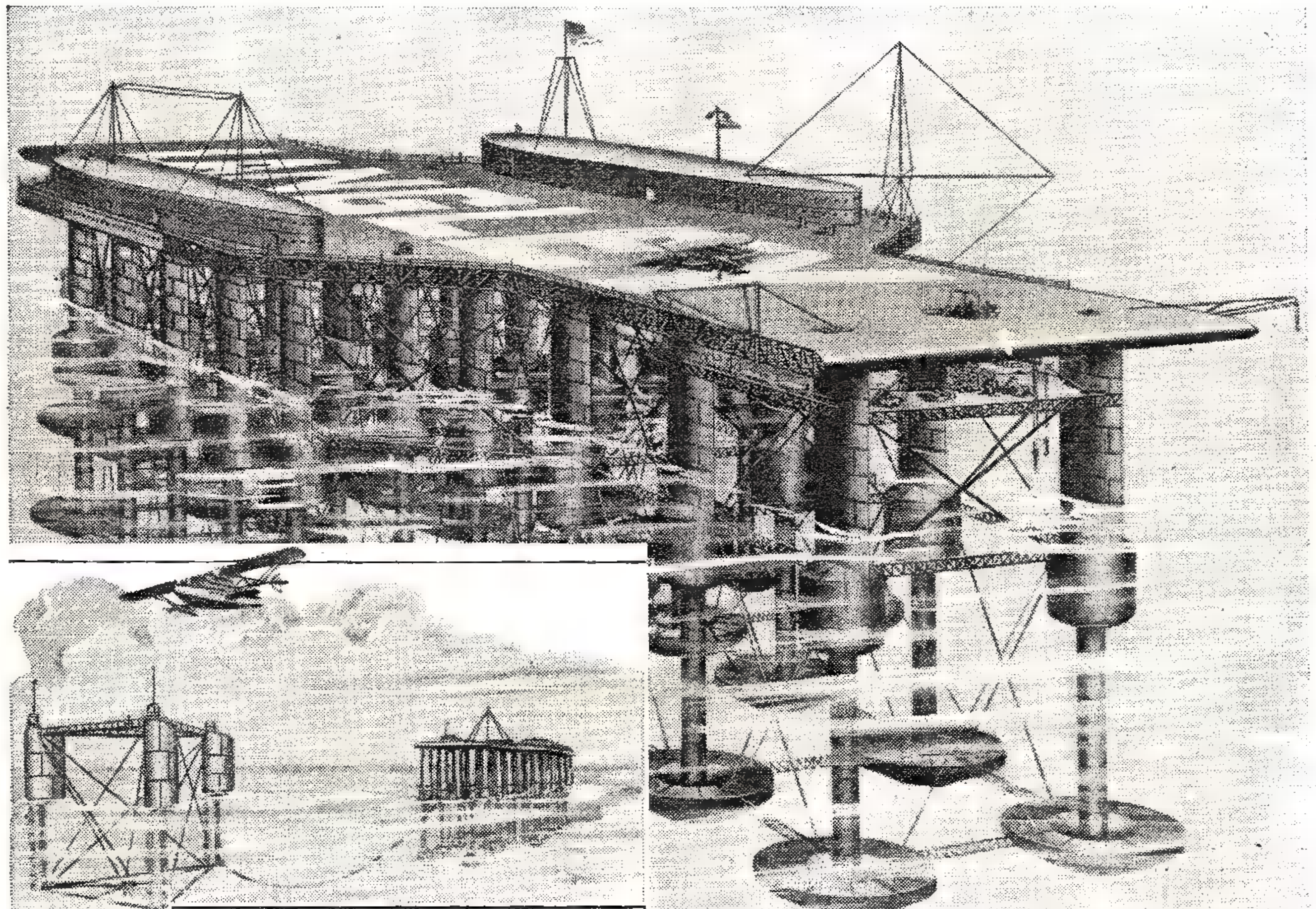
Above: Ann Lee, motion picture player, visiting the American Beauty and Styles Exhibition in the Grand Central Palace, N. Y., tries out the oxygen bubble bath. This new aid to beauty mixes 20 per cent oxygen with air. The treatment results in bleaching, beautifying.

MIDGET HUMIDIFIER

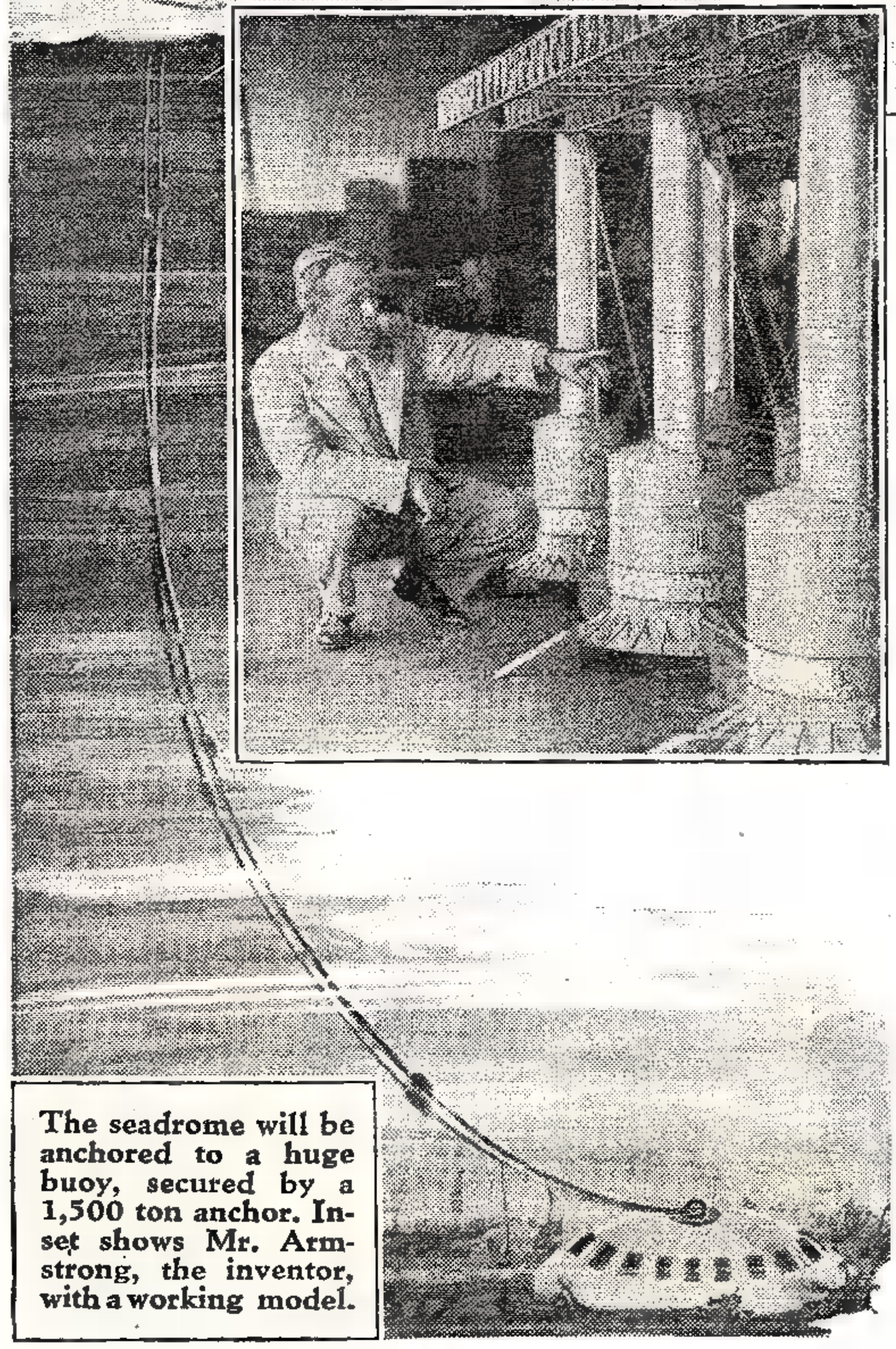


Above is shown a silent portable humidifier for use in rooms difficult to keep comfortable. Right, above, shows new portable home manicure set which much is claimed for, including its ability to do the difficult task of polishing toenails.

FLOATING AIRPORTS to LINK CONTINENTS



Here is what the full sized Armstrong seadrome will look like when completed. At first but one-fourth of it will be built, the more economically to test the flotation principles of the submerged ballast tanks. Later the complete six-acre field may be built, with hotels at the side as shown or else on a lower deck, according to what tests prove.

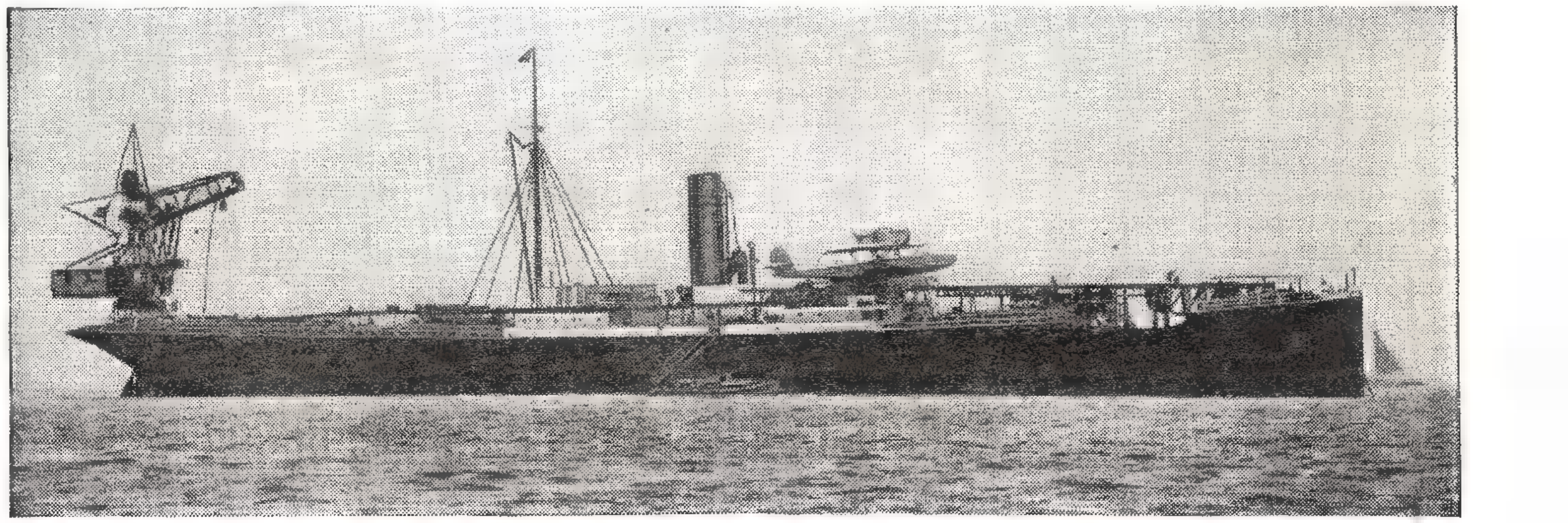


The seadrome will be anchored to a huge buoy, secured by a 1,500 ton anchor. Inset shows Mr. Armstrong, the inventor, with a working model.

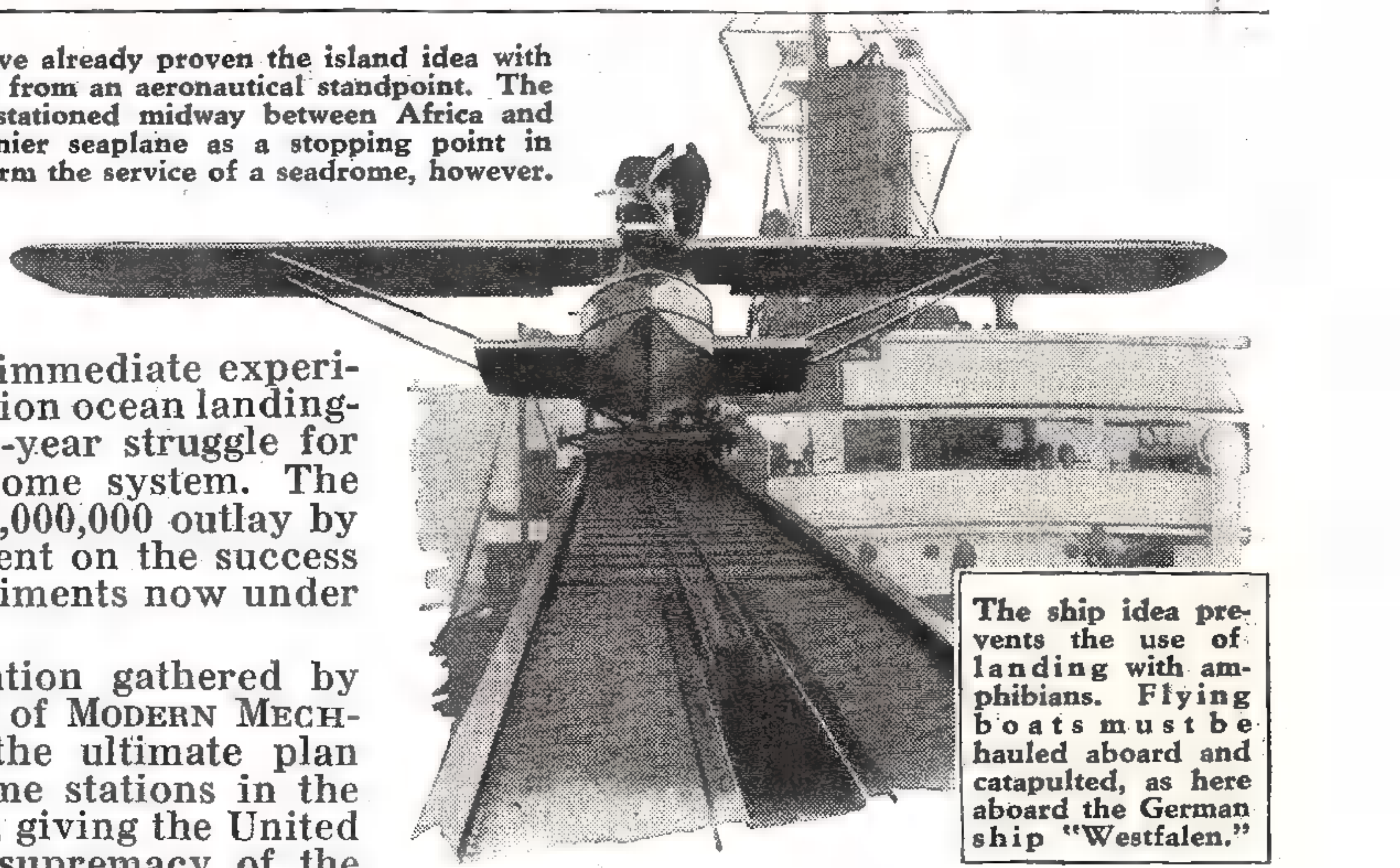
by BEN LINCOLN

FUNDS recently appropriated by the government have put the United States Department of Commerce, Aviation Branch, squarely behind the immediate development of a chain of five floating airports which will span the Atlantic for regular airways service.

This recently announced appropriation, amounting to $1,500,000 was negotiated by Eugene L. Vidal, Director of Aeronautics of the Department of Commerce, in behalf of Edward R. Armstrong, inventor of the seadrome, and completes a 16 year fight to gain recognition for a project which both Mr. Vidal, a competent and experienced airways operator, and Mr. Armstrong solidly believe in. As well, it will provide work for a great number of unemployed, as 80 per cent of the cost of such development projects goes to labor.



The ever enterprising Germans have already proven the island idea with a ship, thus proving the feasibility from an aeronautical standpoint. The "Westfalen," shown above, was stationed midway between Africa and South America, serving the Dornier seaplane as a stopping point in a recent flight. Ships cannot perform the service of a seadrome, however.



The ship idea prevents the use of landing with amphibians. Flying boats must be hauled aboard and catapulted, as here aboard the German ship "Westfalen."

This $1,500,000 is for immediate experiments with a quarter-section ocean landing-field and ends a sixteen-year struggle for recognition of the seadrome system. The final plan calls for a $30,000,000 outlay by the government, contingent on the success of the preliminary experiments now under way.

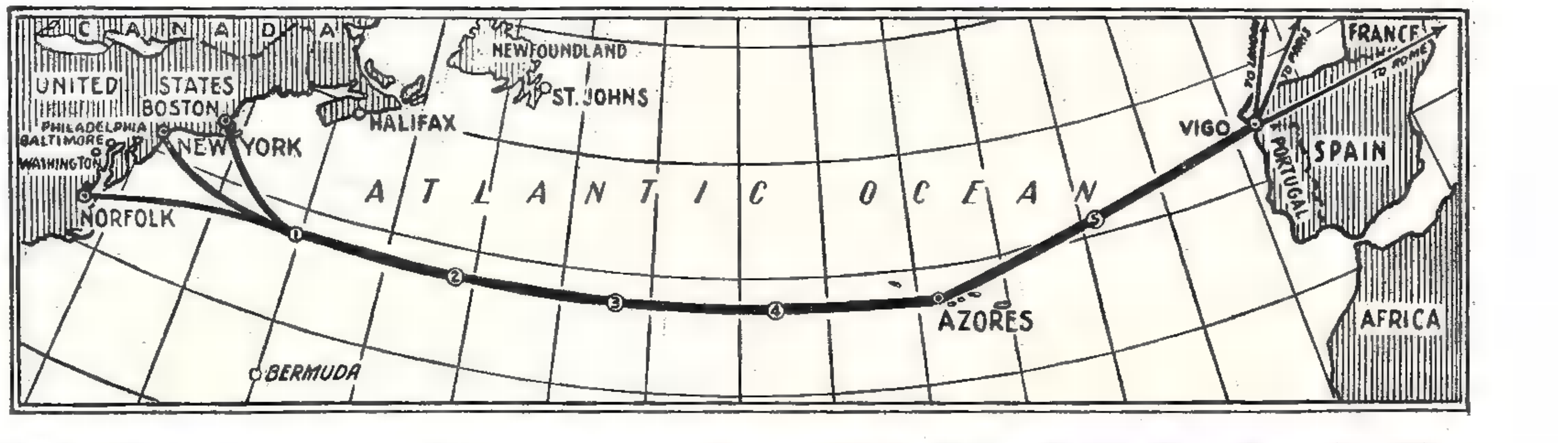
According to information gathered by this member of the staff of MODERN MECHANIX AND INVENTIONS, the ultimate plan calls for similar seadrome stations in the Pacific and other oceans, giving the United States an international supremacy of the air lanes. Great Britain and France both gave the Armstrong plan serious consideration but failed to adopt it.

The proposed system calls for five Armstrong seadromes at 500 mile intervals from the Atlantic seaboard here to the western coast of Europe. Each drome will cost $6,000,000.

Back in 1927 when Armstrong completed his first models of the floating deck, he intended to have hangars and hotels on the six-acre surface. But the design which has been accepted by the government calls for a vacant deck, with hangar and hotel accommodations confined to two or three decks below the surface.

The seadromes will be 1,225 feet long and 300 feet wide. An elevator will take planes

(Continued on page 138)



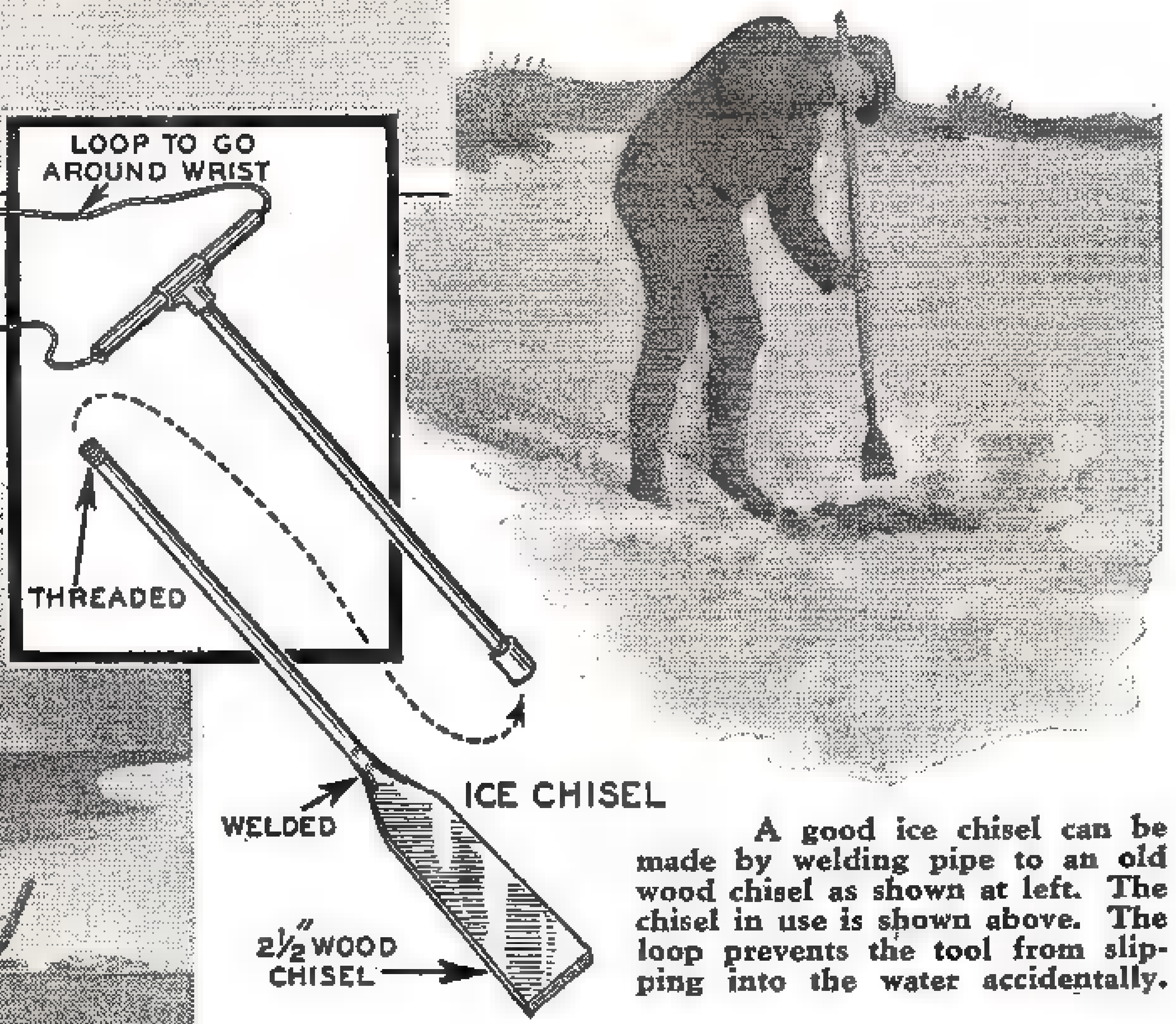
Eventually, if tests prove successful, the government seadrome chain would dot the Atlantic as shown for 30-hour service between Europe and America. These five seadromes would be situated in fair weather latitudes 500 miles apart.

Expert TIPS on WINTER FISHING Through the ICE

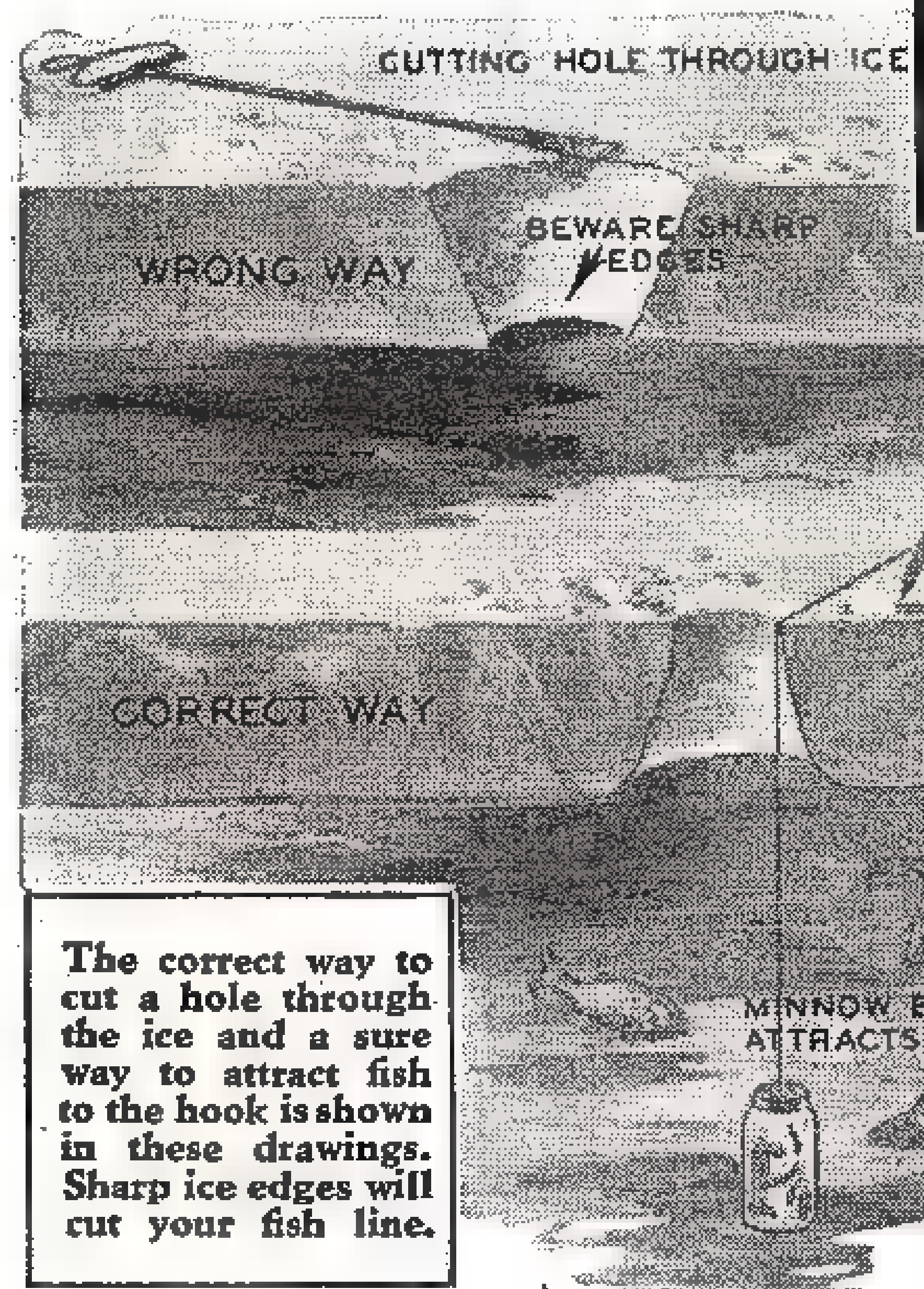
by Robert Page Lincoln

Winter fishing is great sport if you follow these expert hints. You can increase your catch with the home-made equipment described here.

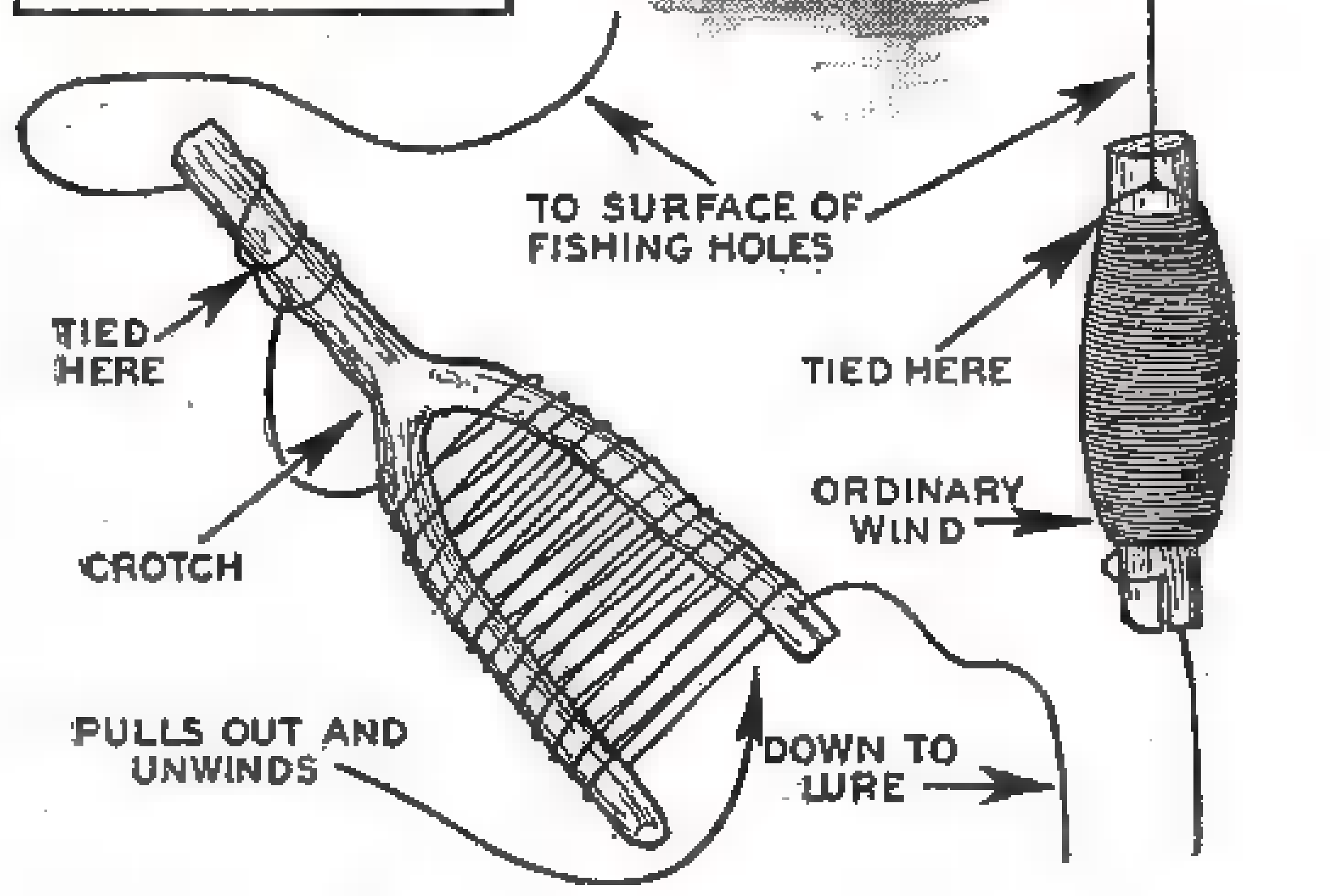
Through the northern ice of Canada Robert Page Lincoln's huskies drag a canoe loaded with provisions. The author has covered the hunting grounds of the continent.



A good ice chisel can be made by welding pipe to an old wood chisel as shown at left. The chisel in use is shown above. The loop prevents the tool from slipping into the water accidentally.



The correct way to cut a hole through the ice and a sure way to attract fish to the hook is shown in these drawings. Sharp ice edges will cut your fish line.



A fish line crotch made from a tree branch will permit a fish to wear itself out as it runs away with the line. Another method, a simple winding stick, is shown at right.

CUTTING through the ice and dropping a baited hook down to the finny inhabitants of the lakes forms a wintry pastime that is indulged in through the whole length and breadth of the snow country.

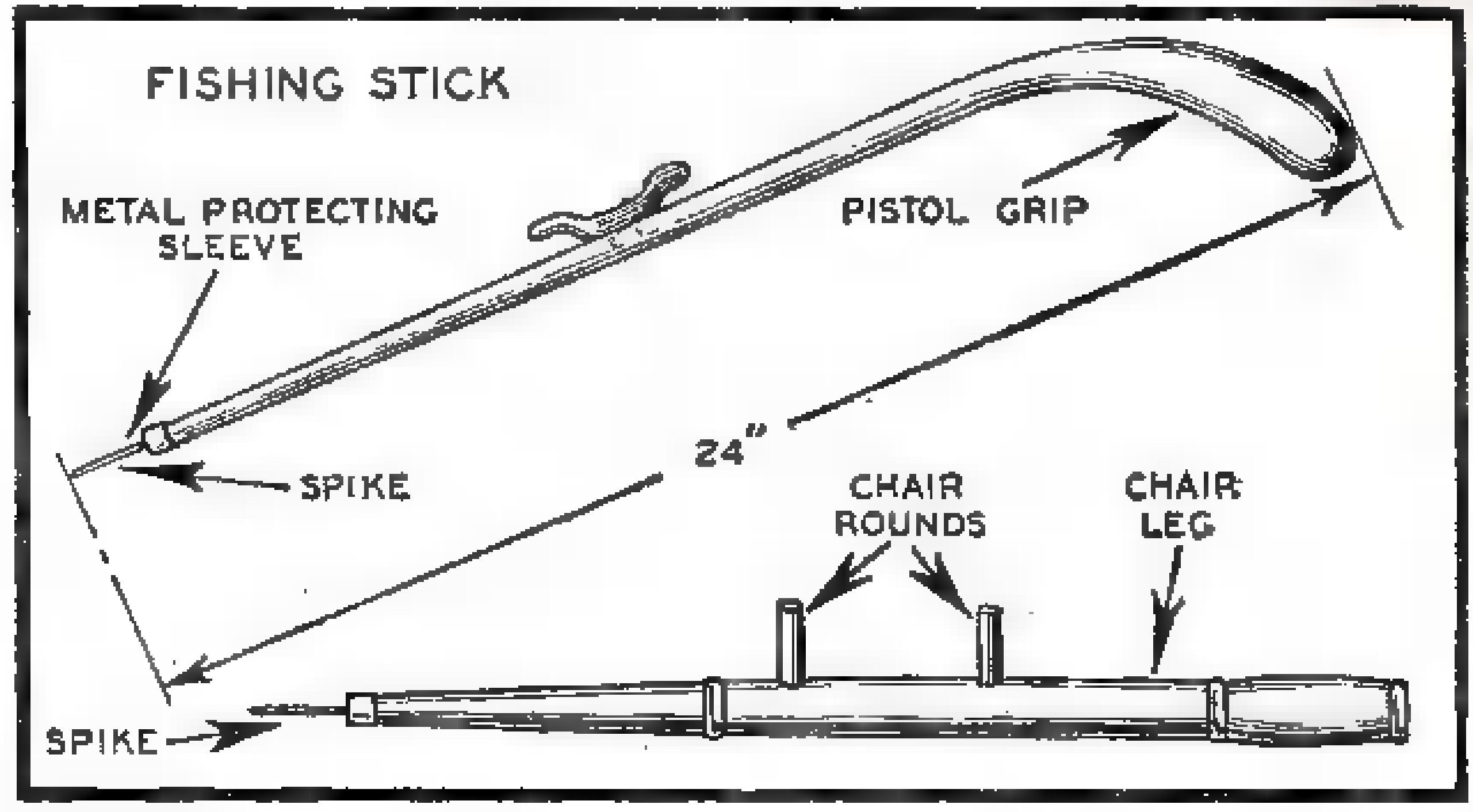
That it can be made a very successful pastime, goes without saying. But to have the best results one must know thoroughly the equipment used and how to use it.

Making Ice Chisel and Fishing Stick

An ice chisel is a real necessity. Some use a common, everyday axe for the purpose, but it is unsafe and far from practical. You can make a good ice chisel by welding an old worn-out two or two and one half inch wood chisel to the end of a pipe one and one half inches in diameter. The total length of this pipe handle is four and one half feet.

To aid in transporting this chisel, it can come in two pieces, jointed in the middle with a threaded end and coupling. To give the proper heft to the pipe section connected to the chisel, pour that end full of lead. Thus every blow driven into the ice will have weight behind it.

To the top of the ice chisel, turn on a T-connection, which will give you a grip, and make it easier to drive into the ice without hurting the hand. Through the hole of the T-connection, insert a loop of clothes-line, for a turn around the hand or wrist, which will prevent loss of the chisel should it slip from the hand.



Two excellent fishing sticks, easy to make, are shown above. Line is wound around the projecting pieces of wood. Spike is jabbed into the ice for leverage against pull of fish after it is "hooked."

Above at right is the chair leg fishing stick in use and at left the fisherman is holding the pistol grip type. Photo at the right is a closeup of the ice fisherman's tools, a home-made ice chisel and the chair leg fish stick. How to make and use these simple, but efficient, fishing tools is described in accompanying article.

The fishing stick is a most desirable item in the ice fisherman's equipment. A very excellent type can be made with a handle that is shaped like a pistol grip. The stick has a notched wooden piece on its side on which to wind the line.

Correct Line and Minnow to Use

A very simple fishing stick, devised by the writer, can be made from the leg of an old chair, leaving two of the rounds intact, cut off about two inches. On these round-ends the surplus line is wound. The turned part of the upper end of this fishing stick makes a good handle.

Fishing sticks may be made from cedar, which provides a light item. To make the "spike" end of the fishing stick, to be poked in the ice or snow at the edge of the fishing hole, drill a hole part way into the end of the stick, drive in a ten penny nail or a spike and then cut off the nail and file sharp. A worn out icepick point makes an unexcelled spike for a fishing stick. A new one costs only five cents.

For crappie, sunfish, perch and similar small fish use a nine pound test, black, tournament line, even lighter than that if desired. For pike and pickerel fishing and heavier fish use eighteen pound test hard-braided line. Use the quill-type of sensitive float, for a cork is often deceiving and is not overly reliable.

Minnows ranging one and one half to two inches in length are best for crappies, sunfish, perch, and other small fish. Minnows ranging three to eight and ten inches are best for wall-eyed pike, great northern pike, pickerel.

Hook the minnow for all manner of ice fishing through the skin and some of the flesh just back of the dorsal (back) fin, but never so deep that the spine is touched as that will kill the minnow. Never hook the minnow as is commonly done in the stom-

GUNS from All NATIONS Stock MOVIE Arsenals

Extreme precautions are taken by movie studios in handling the very real weapons used in filming modern thrillers. Left shows an expert marksman doing his stuff when the script called for a shattered door. Such times, sets are cleared of all hands. Above—A war scene from "Bitter Tea of General Yen."

One type of prop the movies never need to fake is a gun. This is but a part of the arsenal at the Paramount Studios, where weapons of every conceivable vintage and type are kept under double lock and key to prevent mortal accidents either in use or while in storage. Here revolvers of all kinds from a six gun to a pearl handled pistol are stored.

THE machine guns of the beleaguered garrison, making a last stand, are rattling and spitting fire at an enemy whose rifles and revolvers crack viciously in reply. Casualties are strewn everywhere and the acrid smoke of battle hovers over the scene. It is a critical situation, indeed—or appears so.

Then the director shouts "cut," and the "dead" and "wounded" arise and brush themselves off. For it is only a scene from a current talkie, and no one is really "wounded in action."

Prevention of Accidents

Yet accidents might easily occur in making just such movie scenes as this, where firearms are used promiscuously. Unless extraordinary precautions are taken, a real bullet, for instance, might find its way into the thousands of blanks that are fired. And even the blanks themselves might cause severe powder burns and disfigurements within ten feet of firing. For this reason the motion picture studios employ every safeguard possible in the handling of guns and ammunition.

Indeed, as James Stembridge, firearms expert and custodian of the Paramount Studio arsenal, puts it, "Our precautions include everything but hanging a red light on the guns."

"No company on the lot," says Stembridge, "can get firearms, particularly machine guns or ammunition, to use on sets without having a permit signed by the head property man. And no outside studio can rent guns from Paramount without a special permit from the State of California.

Roland Young and Dewey Robinson, well known Paramount featured players, inspect a corner of the Paramount arsenal, where machine guns and special army-type rifles are stocked.

"We keep a record of each gun that goes out of this arsenal—serial number, type, etc.—and we know every minute of the time it is in use just where we can put our hands on it.

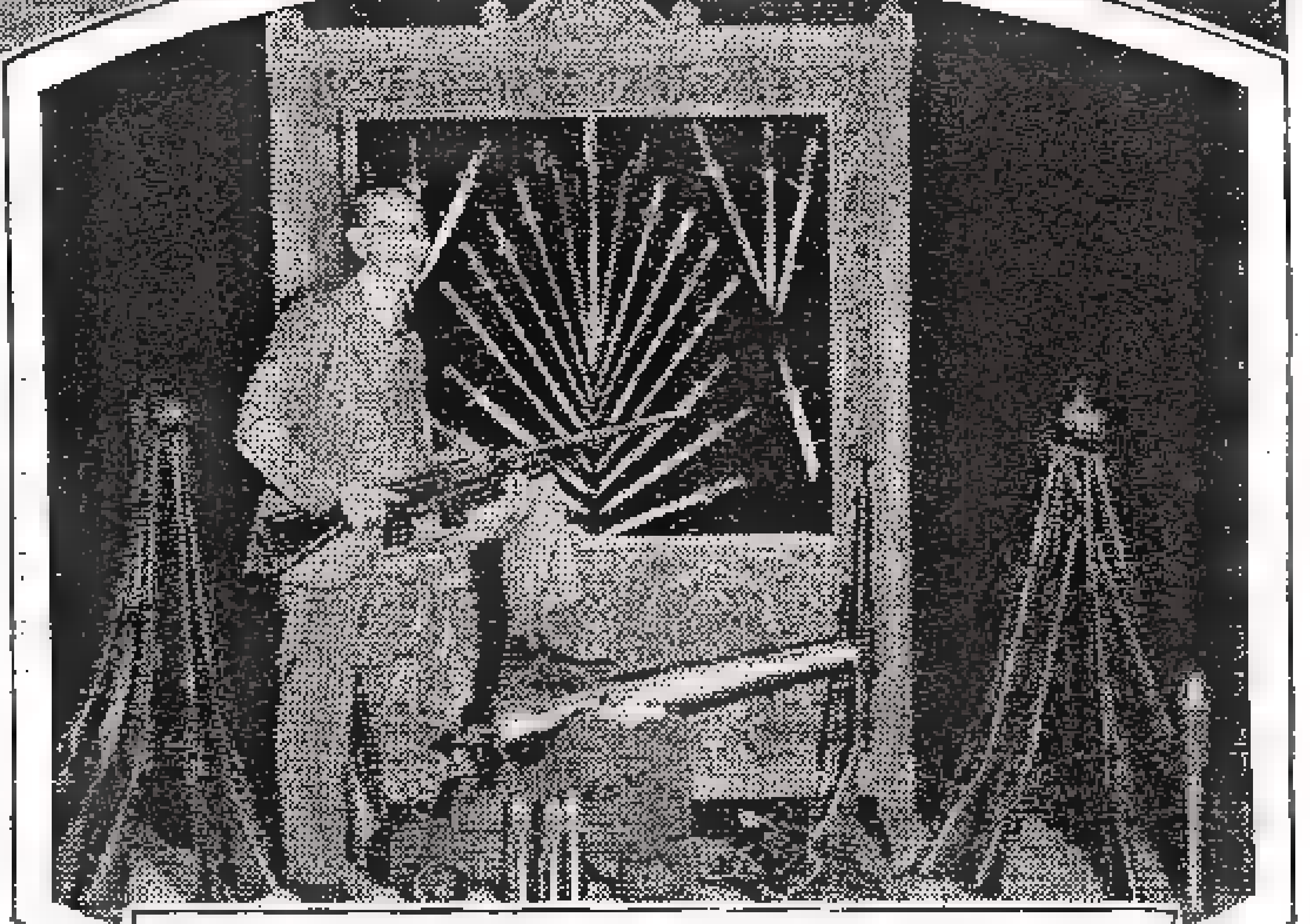
"Our machine guns are kept in vaults and our ammunition in magazines under double lock and key. It is not only impossible for them to be stolen, but no careless person can tamper with them at any time."

When the arsenal gets a properly signed order for guns and ammunition, the weapons are carefully examined by the firearms expert and then locked in boxes to which the head property man has the keys. These boxes are delivered to the set where the company is working. The blank ammunition is also delivered in separate lockers, thus blocking any chance of the guns being loaded by an unauthorized person.

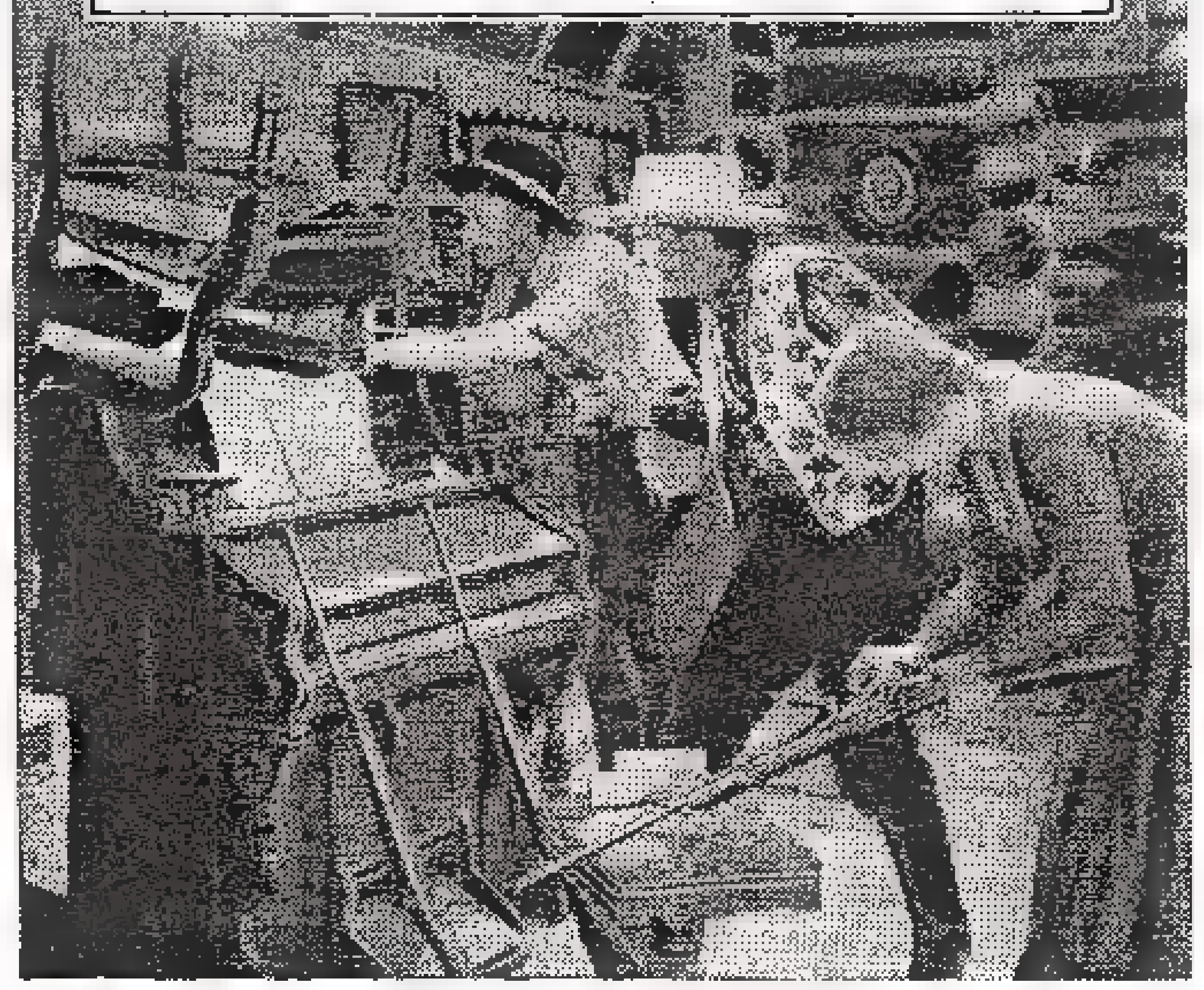
Rehearsals are then gone through, and the scene made ready for actual filming. The head property man in the meantime has loaded the weapons which will figure in the sequence. There is a final pause, when the action side of the set is cleared for forty feet.

Now the director signals "camera" and

(Continued on page 128)



James Stembridge, custodian and fire-arms expert for Paramount, also knows his knives. In his care he has a collection of bayonets for all types of guns used by all nations.

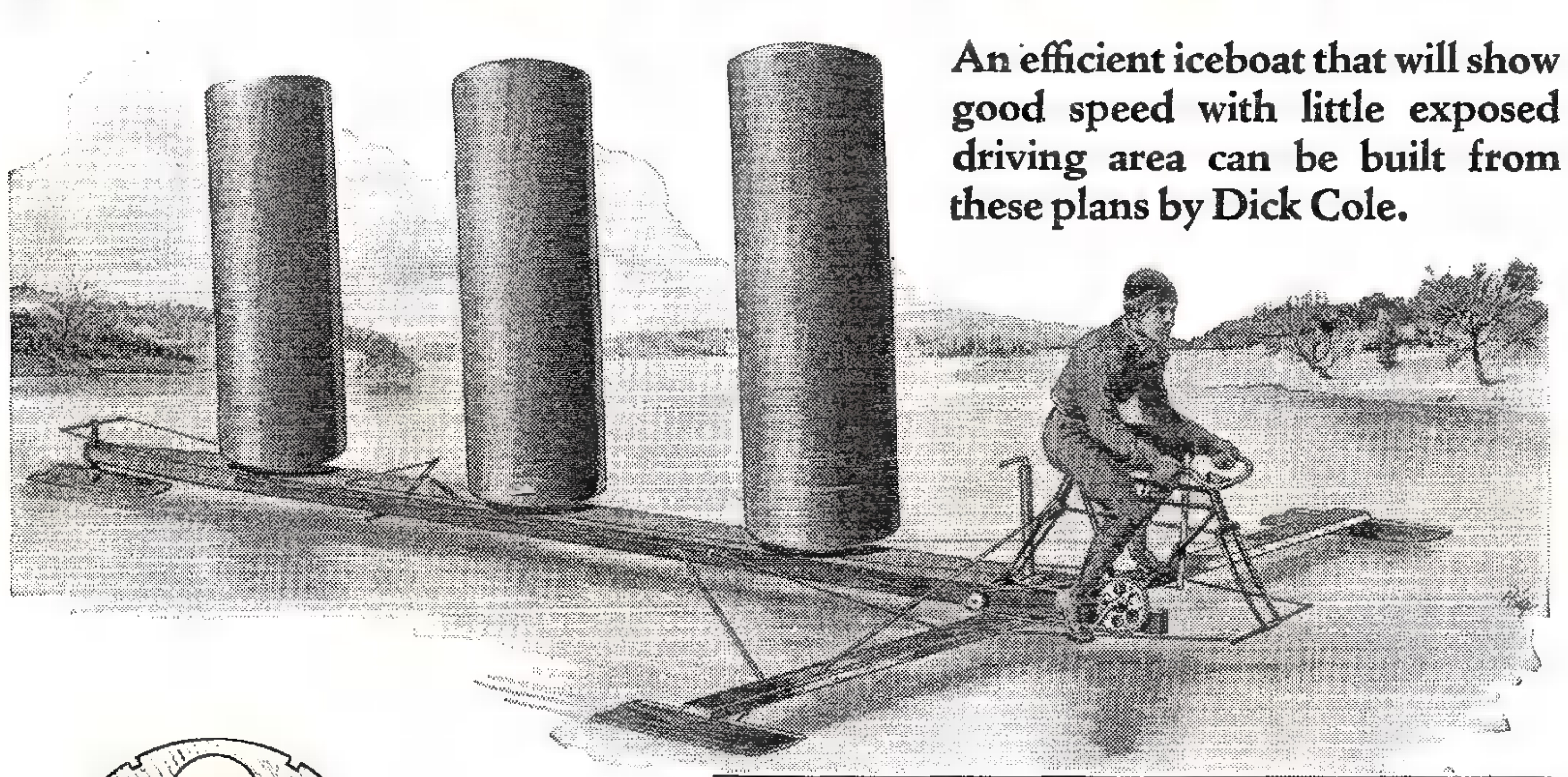


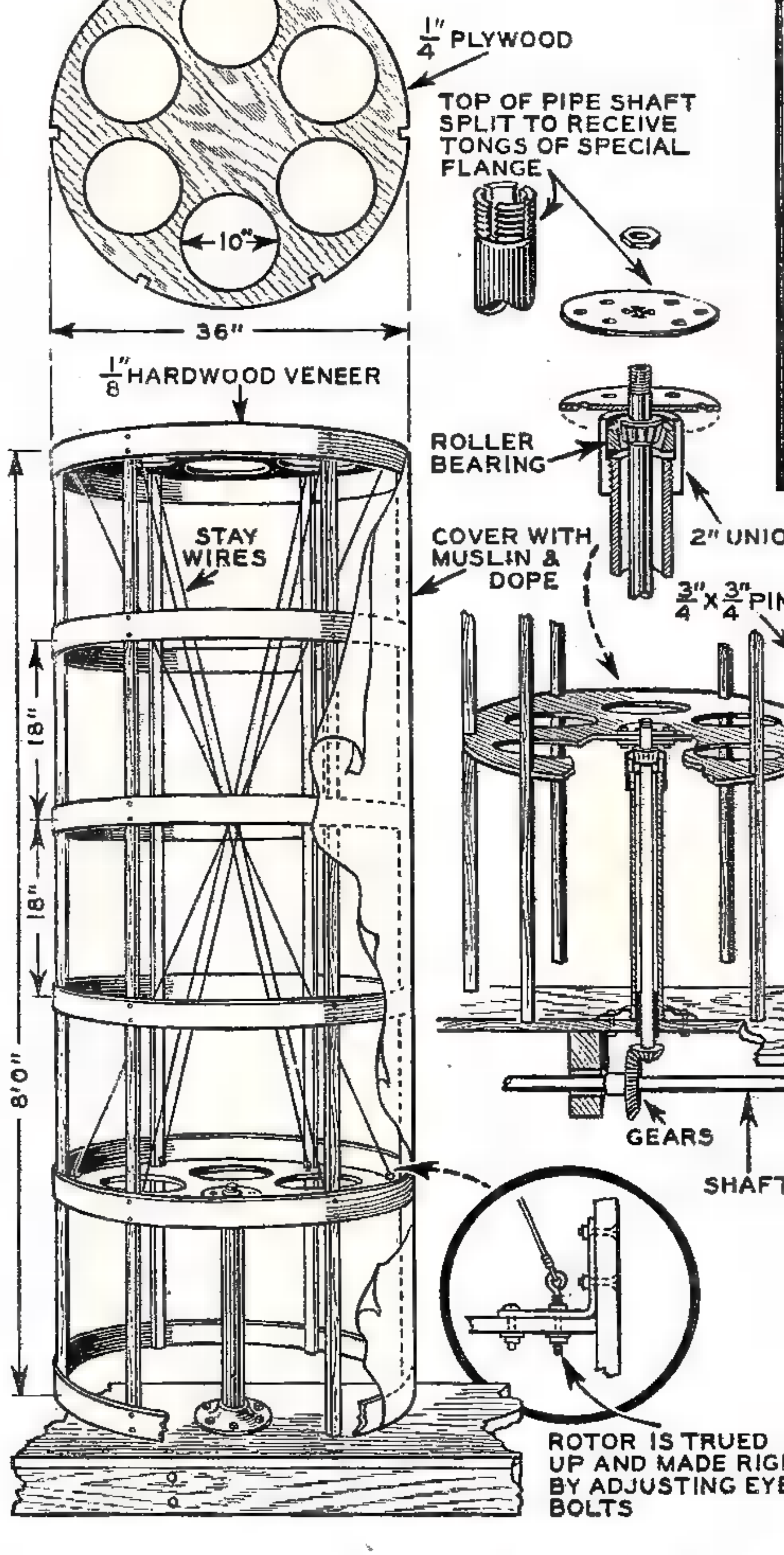
When a special model of gun is called for, such as a flintlock, movie realism demands that powder smoke issue not only from the muzzle, but the breech lock as well.

BUILDING a NOVEL Rotor ICEBOAT

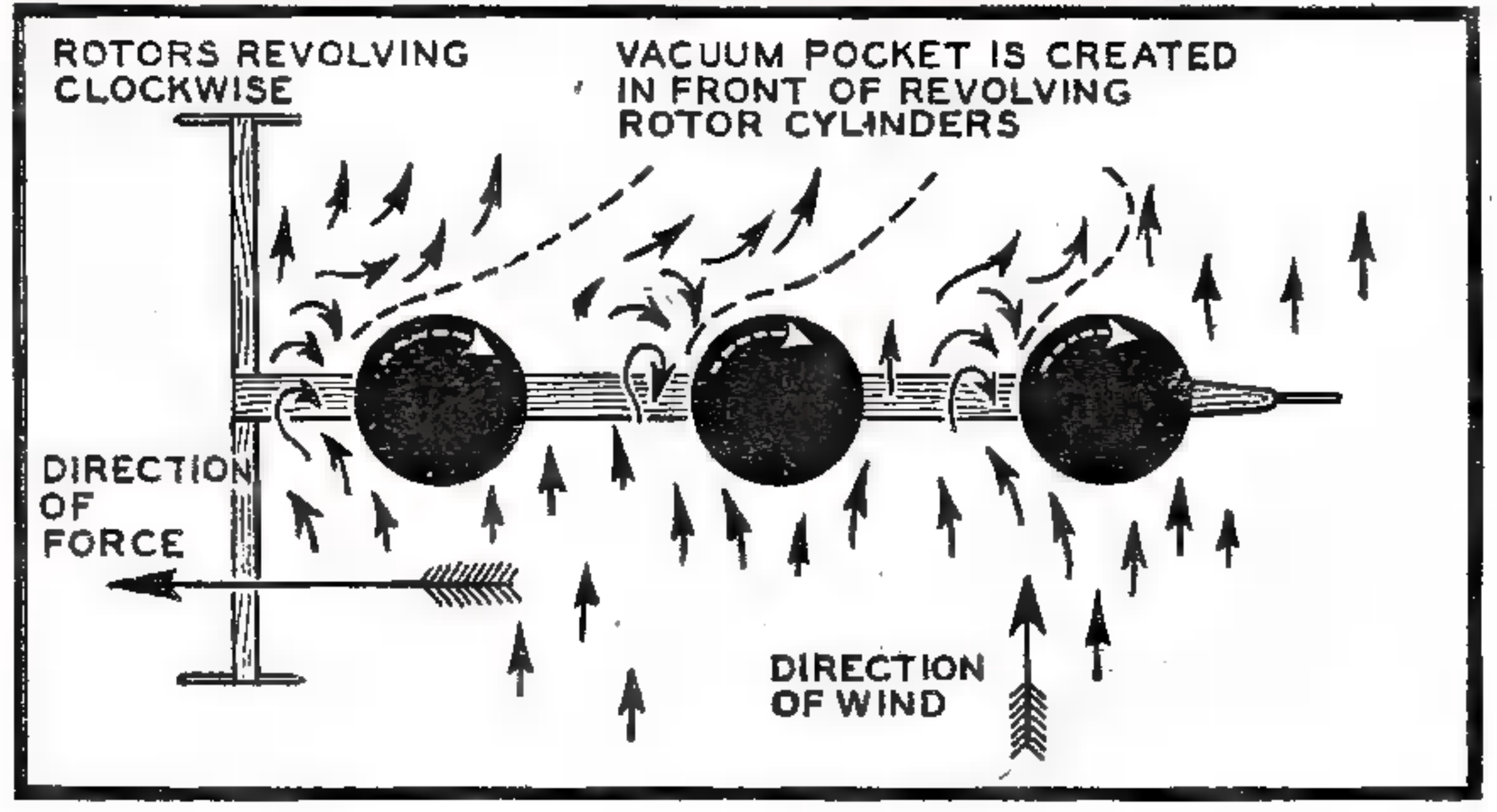
by DICK COLE

An efficient iceboat that will show good speed with little exposed driving area can be built from these plans by Dick Cole.




1/4" PLYWOOD
10"
36"
TOP OF PIPE SHAFT SPLIT TO RECEIVE TONGS OF SPECIAL FLANGE
1/8" HARDWOOD VENEER
ROLLER BEARING
2" UNION
STAY WIRES
COVER WITH MUSLIN & DOPE
3/4" x 3/4" PINE
18"
18"
8'0"
GEARS
SHAFT
ROTOR IS TRUED UP AND MADE RIGID BY ADJUSTING EYE-BOLTS

The rotors are no more difficult to build than big box kites, and are fabricated from veneer, old pipe fittings, wire stays and doped muslin to give the barrel effect.

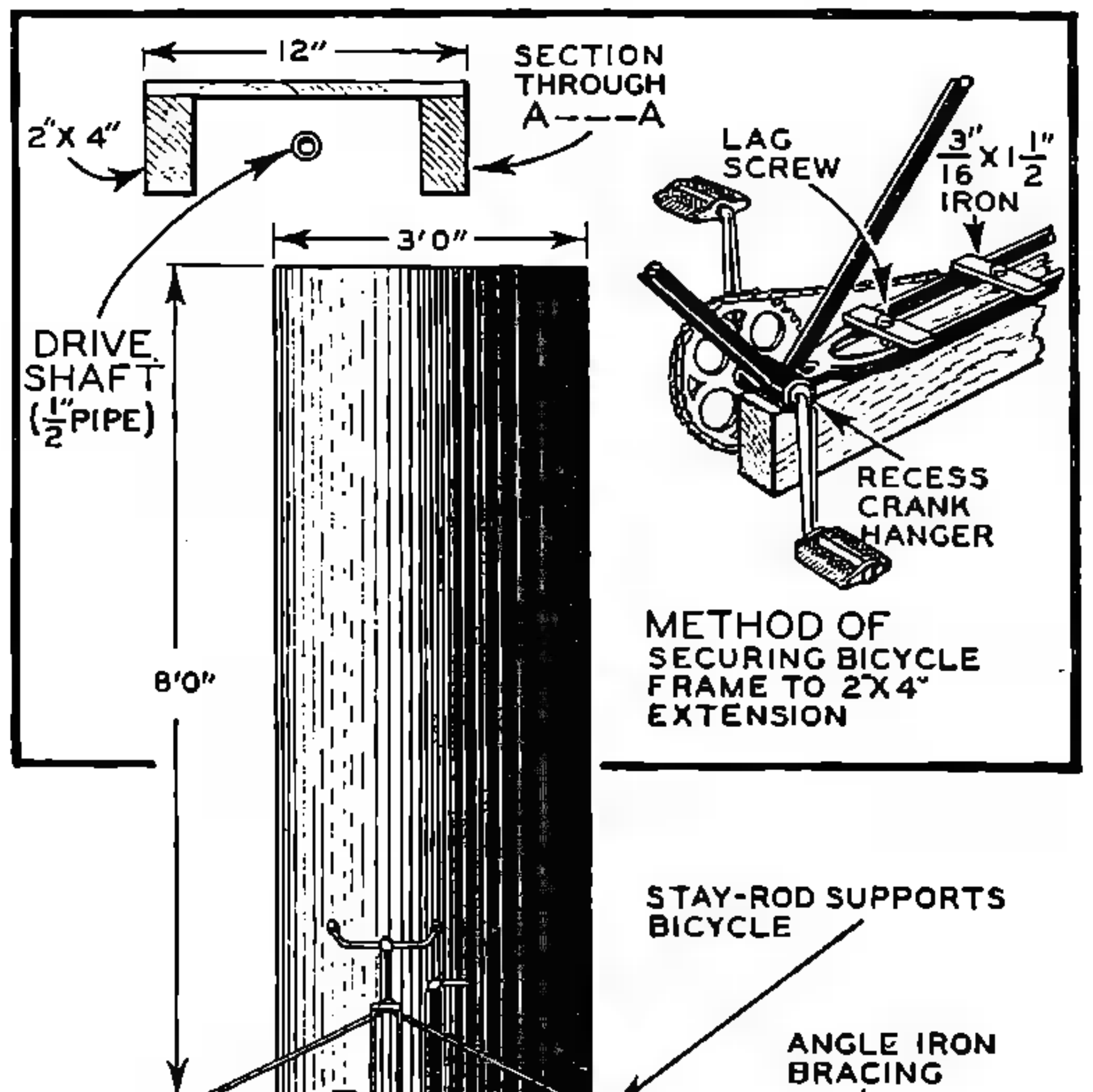

ROTORS REVOLVING CLOCKWISE
VACUUM POCKET IS CREATED IN FRONT OF REVOLVING ROTOR CYLINDERS
DIRECTION OF FORCE
DIRECTION OF WIND

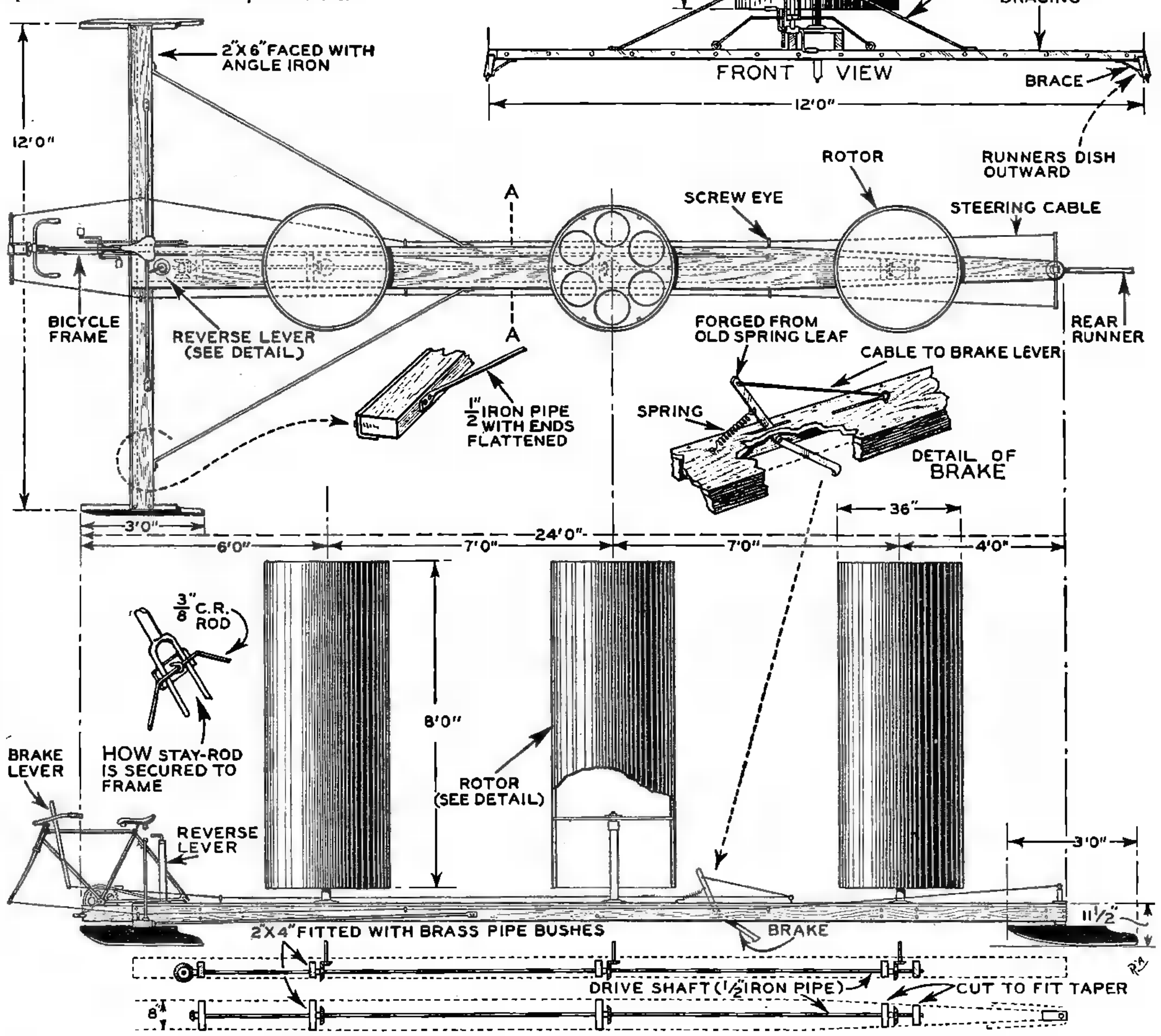
The diagram above explains the rotor driving principle. One can sail into the wind on a fairly sharp tack, but must employ a reversing gear to spin the rotors in opposite rotation in order to tack back the same way.

HERE is something which will tickle the fancy of the ultra-modern experimenter who delights to delve into unplumbed depths—*a rotor iceboat.* Readers of this magazine will have read of the rotor ship built in Germany several years ago. While the principle of operation of this ship was scientifically sound—as proved by practical experiments—commercially, it was a complete flop. No "wind-jammer" of any kind can possibly oust the steamship and the modern motor-ship from the salty waves.

Might as well expect domestic zebras to restore the popularity of equine-drawn vehicles. Nevertheless the German rotor ship did function mechanically as intended, albeit was dependent for its actual propelling power upon the wind, just as much so as an old "Yankee clipper." But it *did* move through the water by "rotor power" application, was maneuverable, and it cruised. If "rotor power" can move a cumbersome hulk through the water, how much more readily can it propel a practically frictionless iceboat over the shimmering ice! And so we have it in our drawings here. A freaky-looking craft—suggests the sky-line of Pittsburgh—but the "derned" thing runs—that is, slides.

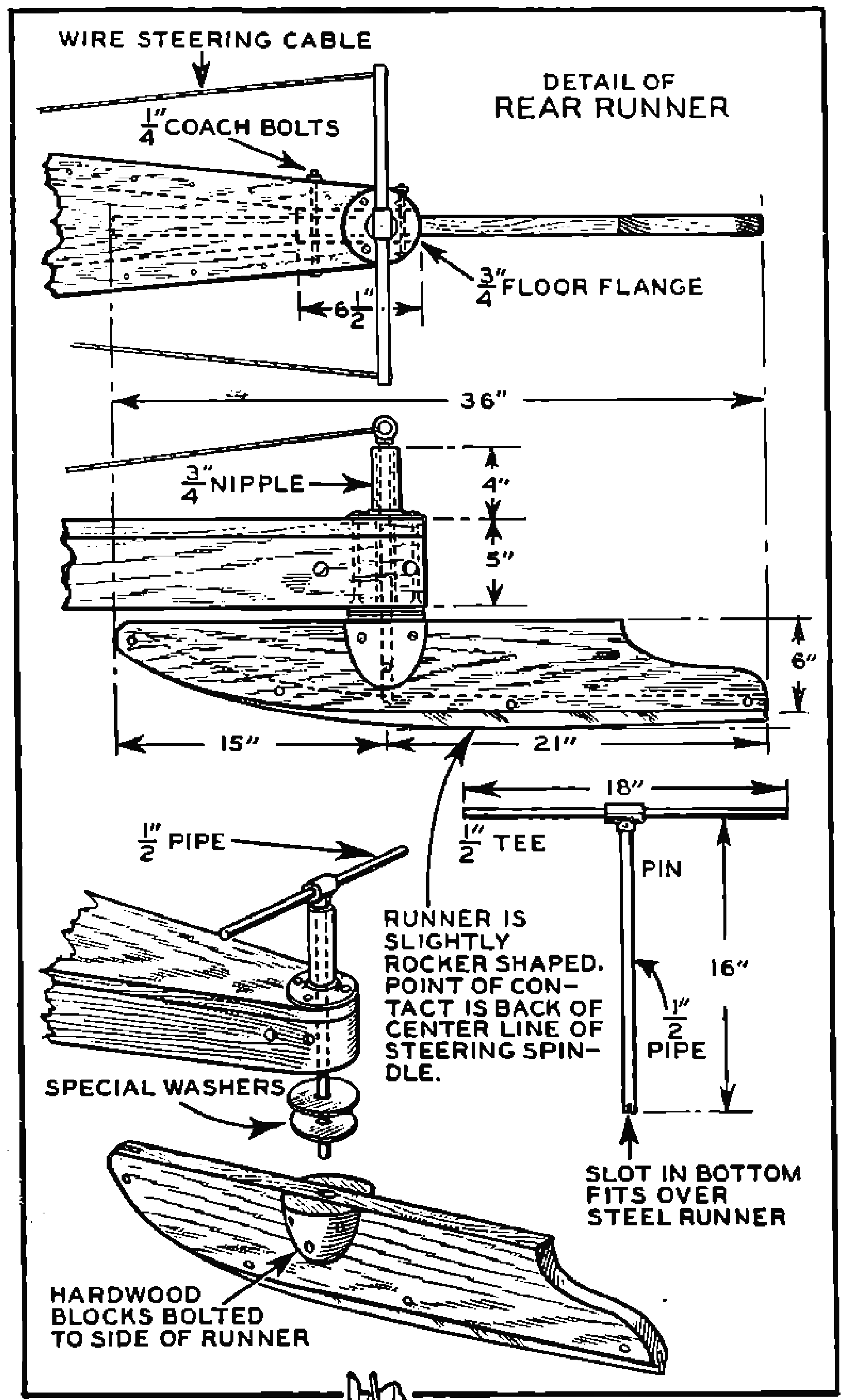
You ask: "What is this 'rotor power,' anyway?" The drawing illustrates the principle, and shows its application to the iceboat. Here's the dope: when a current of air—wind—strikes against a revolving cylindrical surface, the air is diverted in the direction of revolution. However, it does not cling to the surface, but is thrown off at a tangent, creating a vacuous pocket in front of the cylinder. Obviously the cylinder tends to move into the vacuous space, and pulls with it the body to which it is attached. A simple rule decides the direction of the force. When the cylinder revolves clock-wise, let the index finger of the *right* hand indicate direction of wind. Now spread out the thumb at right angle to index finger. It shows the direction of force. With a counter-clockwise revolving cylinder use the *left* hand.


12"
SECTION THROUGH A---A
2"X 4"
DRIVE SHAFT (1/2" PIPE)
3'0"
8'0"
LAG SCREW
3/16" X 1 1/2" IRON
RECESS CRANK HANGER
METHOD OF SECURING BICYCLE FRAME TO 2"X 4" EXTENSION


STAY-ROD SUPPORTS BICYCLE
ANGLE IRON BRACING
FRONT VIEW
BRACE
12'0"
RUNNERS DISH OUTWARD
2"X 6" FACED WITH ANGLE IRON
12'0"
ROTOR
SCREW EYE
STEERING CABLE
A
A
BICYCLE FRAME
REVERSE LEVER (SEE DETAIL)
REAR RUNNER
FORGED FROM OLD SPRING LEAF
CABLE TO BRAKE LEVER
1/2" IRON PIPE WITH ENDS FLATTENED
SPRING
DETAIL OF BRAKE
36"
3'0"
6'0"
7'0"
24'0"
7'0"
4'0"
3/8" C.R. ROD
HOW STAY-ROD IS SECURED TO FRAME
8'0"
BRAKE LEVER
REVERSE LEVER
ROTOR (SEE DETAIL)
3'0"
1 1/2"
2"X4" FITTED WITH BRASS PIPE BUSHES
BRAKE
DRIVE SHAFT (1/2" IRON PIPE)
CUT TO FIT TAPER
8"
RA

The disposition of the rotors, the size of the iceboat, and the driving details are shown in the drawings above. There is another detail drawing which shows the reverse mechanism used on opposite tacks. Note construction of the brake.

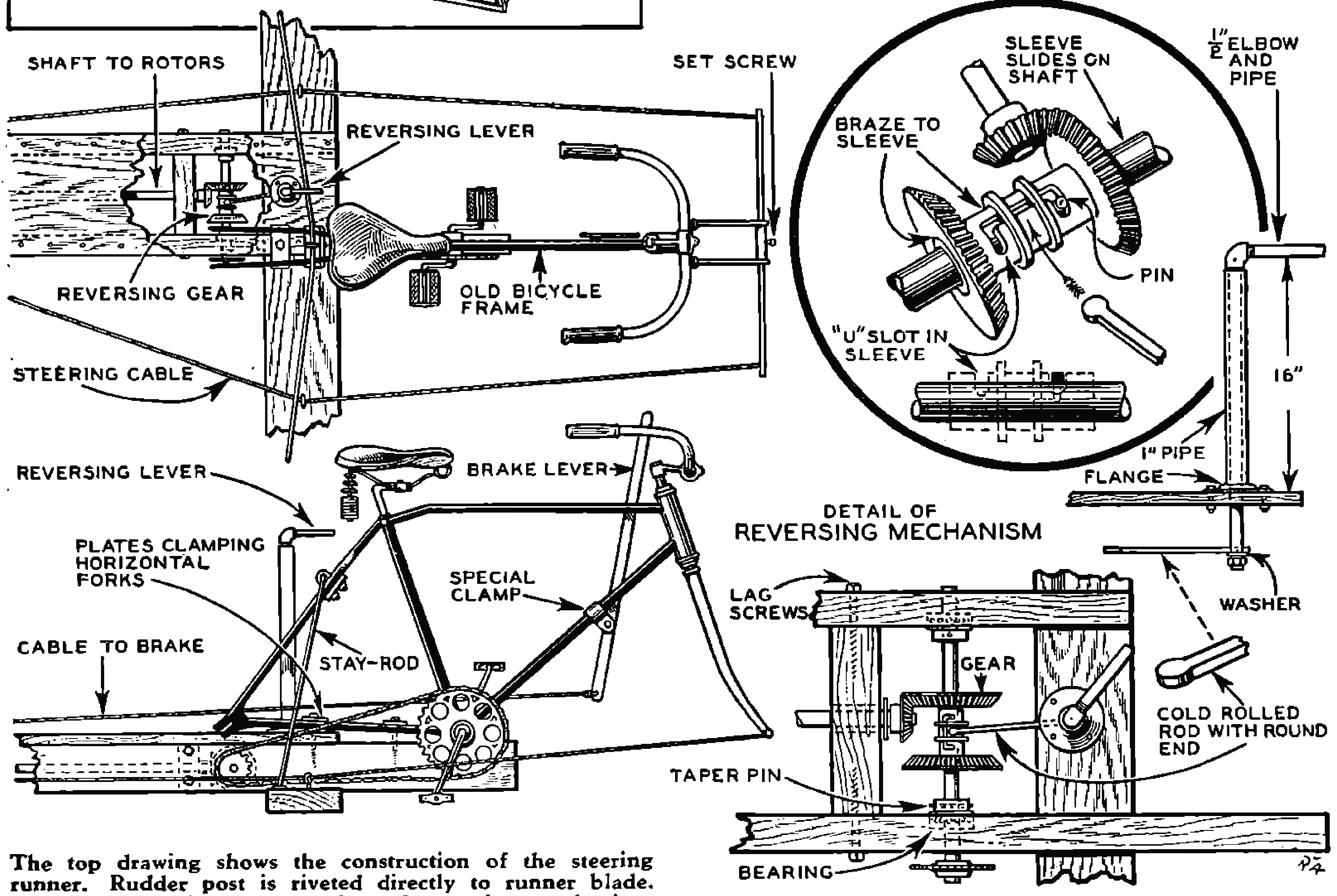
Reverse and Pedaling Machinery


WIRE STEERING CABLE
DETAIL OF REAR RUNNER
¼" COACH BOLTS
¾" FLOOR FLANGE
6½"
36"
¾" NIPPLE
4"
5"
6"
15"
21"
18"
½" TEE
PIN
16"
½" PIPE
½" PIPE
RUNNER IS SLIGHTLY ROCKER SHAPED. POINT OF CONTACT IS BACK OF CENTER LINE OF STEERING SPINDLE.
SPECIAL WASHERS
SLOT IN BOTTOM FITS OVER STEEL RUNNER
HARDWOOD BLOCKS BOLTED TO SIDE OF RUNNER

From the foregoing one will have learned what "rotor power" is all about. Now we will apply it to the iceboat. Let it be said right now that the amateur builder need not "shy" at the construction; it is not at all complicated nor is it costly. A bicycle is temporarily requisitioned to provide the motive power; the shafting, for the most part, is ½" pipe (second-hand, at that); the bevel gears can be bought at any auto wrecking yard for "six bits"; the rotors are a skeleton frame-work covered with muslin, and "doped". A few miscellaneous pipe fittings complete the list of material.

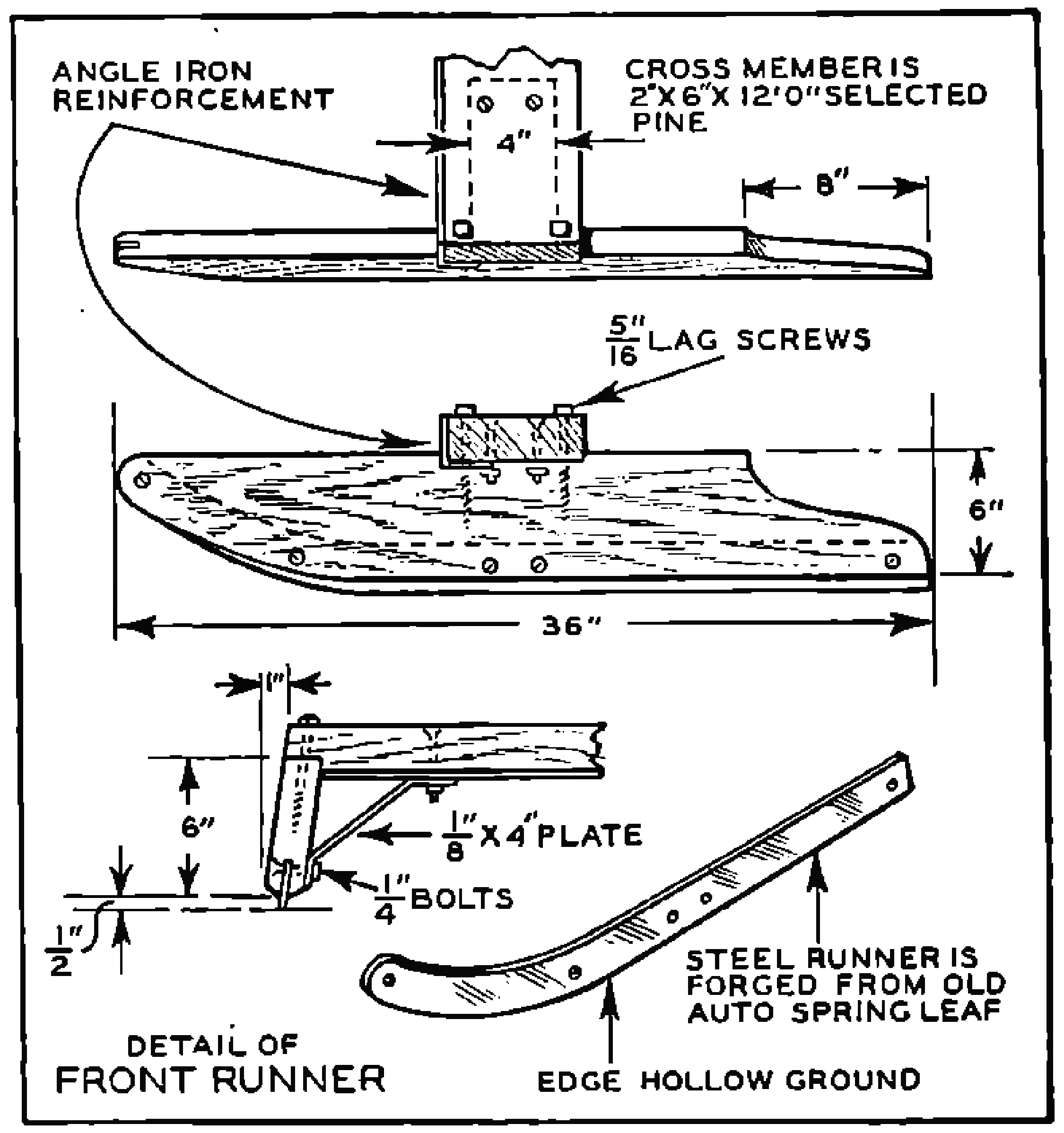
From the plan and elevations the builder can readily construct the frame, and can mount the bicycle—sans wheels—on the projecting right front end of the frame. It will be seen that the drive shaft, with its supporting cross members, is built up as a separate assembly, and afterward slipped up between the 2 by 4's of the main frame and secured with ½" lag-screws. All the bevel gears on the drive-shaft are "spider" gears from old differentials. The gears are bored out so that they are a light driving fit on the ½" pipe which serves as the shaft. Their mating gears are on the vertical shafts of the rotors. Before permanently pinning any of the gears to the shaft, it is well to try them out and determine their actual pitch line first.

The brake is incorporated into the main frame assembly, and should be built into the frame at this time. Its construction and operation is so simple that it needs no elaboration: The drawing shows the simple clip which serves as the fulcrum for the brake lever.


SHAFT TO ROTORS
SET SCREW
REVERSING LEVER
REVERSING GEAR
OLD BICYCLE FRAME
STEERING CABLE
REVERSING LEVER
BRAKE LEVER
PLATES CLAMPING HORIZONTAL FORKS
SPECIAL CLAMP
CABLE TO BRAKE
STAY-ROD
TAPER PIN
SLEEVE SLIDES ON SHAFT
½" ELBOW AND PIPE
BRAZE TO SLEEVE
PIN
"U" SLOT IN SLEEVE
16"
1" PIPE
FLANGE
DETAIL OF REVERSING MECHANISM
LAG SCREWS
WASHER
GEAR
COLD ROLLED ROD WITH ROUND END
BEARING

The top drawing shows the construction of the steering runner. Rudder post is riveted directly to runner blade. Details below show construction of reversing mechanism, which is extremely simple and easy to build and should deter no one from building this big dollar's worth of fun.

Details of Runner Bracing


ANGLE IRON REINFORCEMENT
CROSS MEMBER IS 2"X6"X 12'0" SELECTED PINE
4"
8"
5/16" LAG SCREWS
6"
36"
1"
⅛"X4" PLATE
6"
¼" BOLTS
½"
STEEL RUNNER IS FORGED FROM OLD AUTO SPRING LEAF
DETAIL OF FRONT RUNNER
EDGE HOLLOW GROUND

The method of bracing the front and side runners, as well as construction of the blade itself is shown here.

We will now take up the construction of the runners for the iceboat. One drawing shows the front runners. The runner body proper is cut from a piece of selected maple or oak 1"x6"x36". A 2" groove 3/16" wide is cut on the lower edge of the runner. This can be readily done on a circular saw. Again one visits the auto junkman and obtains three old spring leaves 3/16"x2½" and over 40" long. Any blacksmith can quickly forge these as shown in the insert drawing. Also drill the holes and then re-temper.

Note particularly that the runners are dished outward 1". This adds strength to the construction and brings a keen edge in contact with the ice to prevent side slipping. The runners are secured to the cross-member of the frame with 5/16" lag-screws, and still further re-inforced with a ⅛" angle-plate underneath.

Rudder Runner

Now we come to the rear runner, which, of course, serves as rudder. For the most part, the construction parallels that of the front runners. However, the body is cut from 1½" stock and the steel runner is slightly "rockered" to facilitate steering. Note the sectional conical blocks bolted to the sides of the runner. These are to give a greater surface for the swivel washers. The rear elevation shows clearly how a ¾" floor flange and 4" nipple serve as a housing for the ½" rudder shaft. Note detail of rudder shaft. Note how the notch in the bottom rivets over the steel runner assuring rigidity. An essential point in the rear runner construction is that the point of contact with the ice is *back* of the center-line of the rudder shaft.

Now for the rotors themselves! The drawings present the construction so clearly that little need be said in addition. Particular attention is called to the ball (or roller) bearings at the top of the drive-shaft housing. The housing itself is a 24" length of 2" pipe held in a floor flange. A 2" union at the top is machined out to receive a front wheel bearing from a junked car (page the junkman again).

Note the special flanges, which secure the rotor disk to the drive shaft. These can be cut out with saw, chisel, and file. The holes are cut out of the plyboard disk solely to lighten rotor.

Rotor Covering

Also depicted are reinforcement angle brackets and the eye-bolts with which the stay-wires are adjusted. The frame is accurately trued up before the muslin covering is put on. Unbleached muslin is the covering. After being stretched on it is sprayed with water. Upon drying out it will shrink "as tight as a drum." It is then sprayed with airplane dope or lacquer. A finishing coat of aluminum paint enhances the appearance.

Now we come to a very essential factor in the construction: means of reversing the direction of revolution of the rotors. This is as essential as swinging the boom of a sail to catch the wind at the proper angle. In fact it serves a similar purpose.

The details of the reversing gear are fully shown. It will be seen to be the acme of simplicity. First note how the original chain and rear sprocket of the bicycle are re-located to drive the cross-shaft. If the original bike sprocket is used it will probably have to be welded or brazed to the end of cross-shaft. However, any of the "stock gear" manufacturers make sprockets with a hub which can be pinned or keyed to the shaft.

Note how old front wheel bearings (page Ikey again) support the cross-shaft. Not only do these provide frictionless bearings, but they take up the thrust of the bevel gears as well.

It will be seen that the driving gears of the reverse gear are brazed to a sleeve which is free to slide upon the drive shaft. A hardened ⅜" pin screwed in the shaft engages a U slot in the sleeve. To reverse the gears, the pilot momentarily back-pedals on the bicycle. This throws the pin out of the slot parallel with the circumference of the sleeve. With the reverse level, within convenient reach of the pilot, the gear sleeve is moved so that the pin engages in opposite slot. Simple? What!

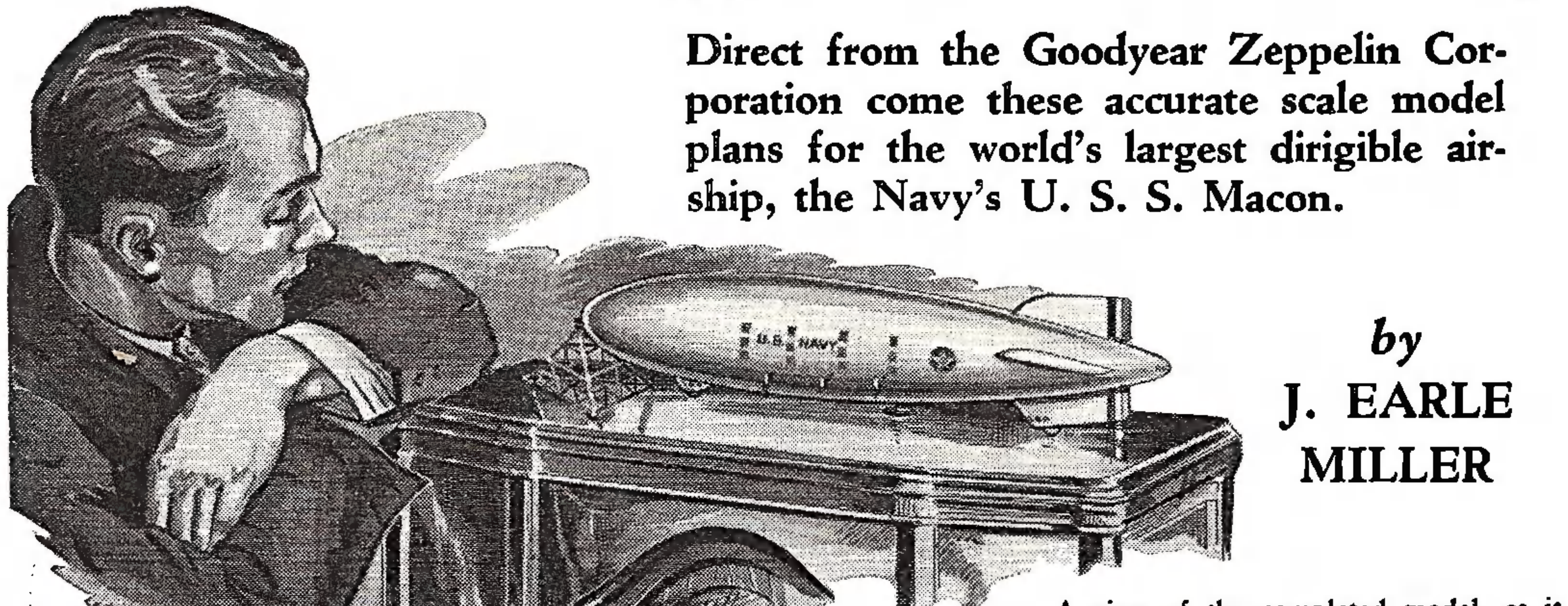
There's your *rotor iceboat*. Now go it. All you need is a fairly smooth ice surface and a 15, or more, mile an hour wind. Obviously one needs a cross wind, but, nevertheless, the rotor iceboat can be brought "close into the wind" the same as any wind-jammer. The pilot will quickly learn the peculiarities of rotor sailing from experience. It requires very little muscular effort to maintain the rotation of the rotors. They should revolve 200, or more, revs. per minute.

Build This Scale Model of the Dirigible U. S. S. Macon

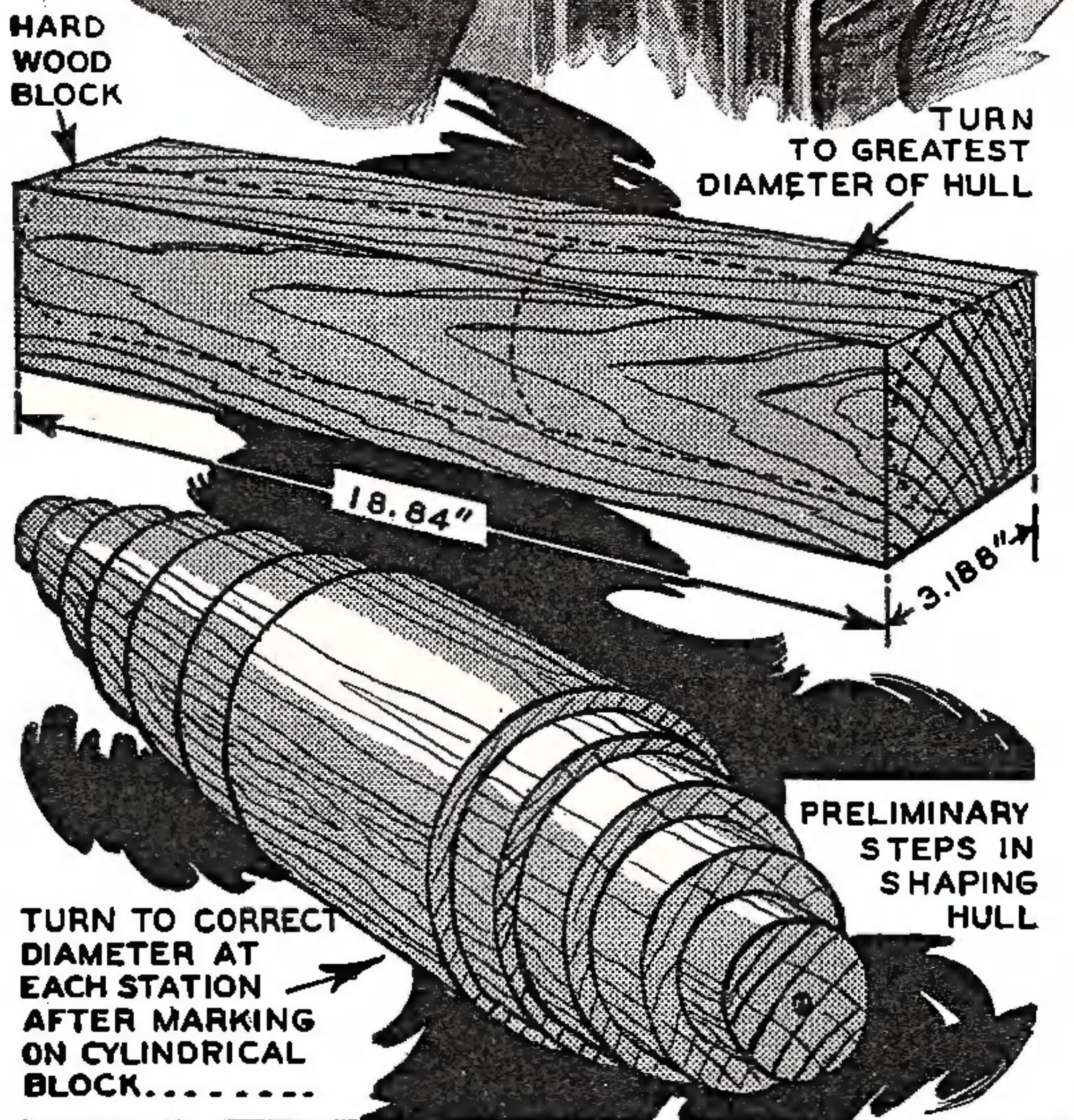
Direct from the Goodyear Zeppelin Corporation come these accurate scale model plans for the world's largest dirigible airship, the Navy's U. S. S. Macon.

by

J. EARLE MILLER



A view of the completed model, as it is supported on the mantel by its portable mooring mast, by the bumper under the lower vertical fin, and by a length of bus wire.


HARD WOOD BLOCK
TURN TO GREATEST DIAMETER OF HULL
18.84"
3.188"
PRELIMINARY STEPS IN SHAPING HULL
TURN TO CORRECT DIAMETER AT EACH STATION AFTER MARKING ON CYLINDRICAL BLOCK.........

HERE they are—scaled plans for a dandy model of the pride of our Navy, the U.S.S. Macon. Eighteen inches long she'll be, with mooring mast, control cab 'n everything, and she'll look swell in her glistening coat of aluminum, sitting up there on the mantel.

The hull of the Macon is turned from a block of hard wood, first to its largest diameter of 3.188", and then down to the correct diameter at each station, as shown on the drawings. All dimensions are given in decimal fractions of an inch, to facilitate the scale reduction. A 6" steel scale graduated in hundredths of an inch should be used in laying out the hull.

All fins are carved from wood to the size of the full size pattern shown. The bottom vertical fin is different from the other three, in that it has a control car in its leading edge, and a bumper beneath to protect it when the ship is on the ground. Windows in its leading edge are cut into the fin with a knife and small chisel, and painted with white paint to which a small amount of blue has been added to give the bluish tint of glass. Hollow out slightly the edges to be glued to the hull, then glue them in place, using small brads if necessary.

The control car is carved from wood to the dimensions shown, windows are cut in and painted, and it is glued in place.

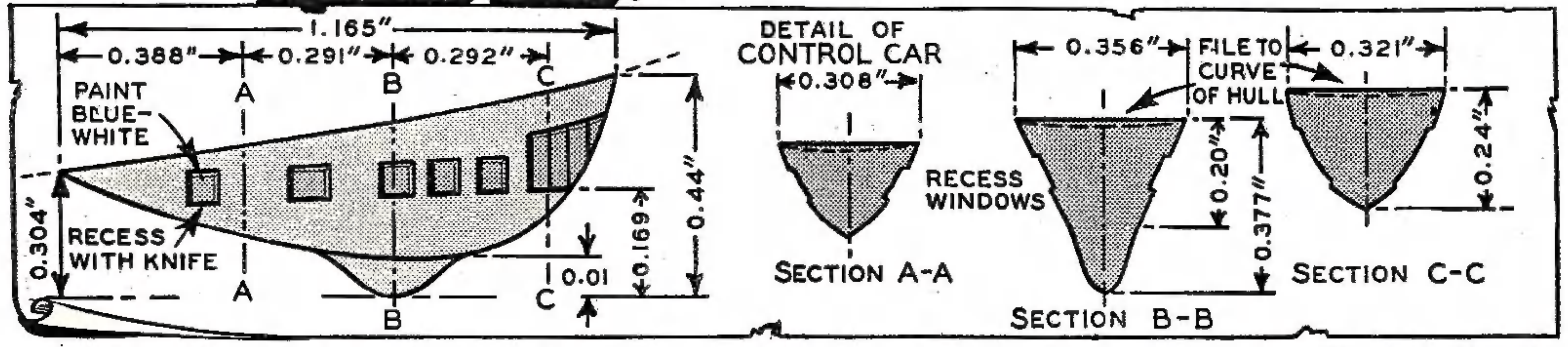
Since the Macon's eight Maybach engines are mounted inside the hull, only the outriggers on the eight propellers need be made. Drive shafts from each engine lead to swiveling balls containing bevel gears to which the propellers are attached.

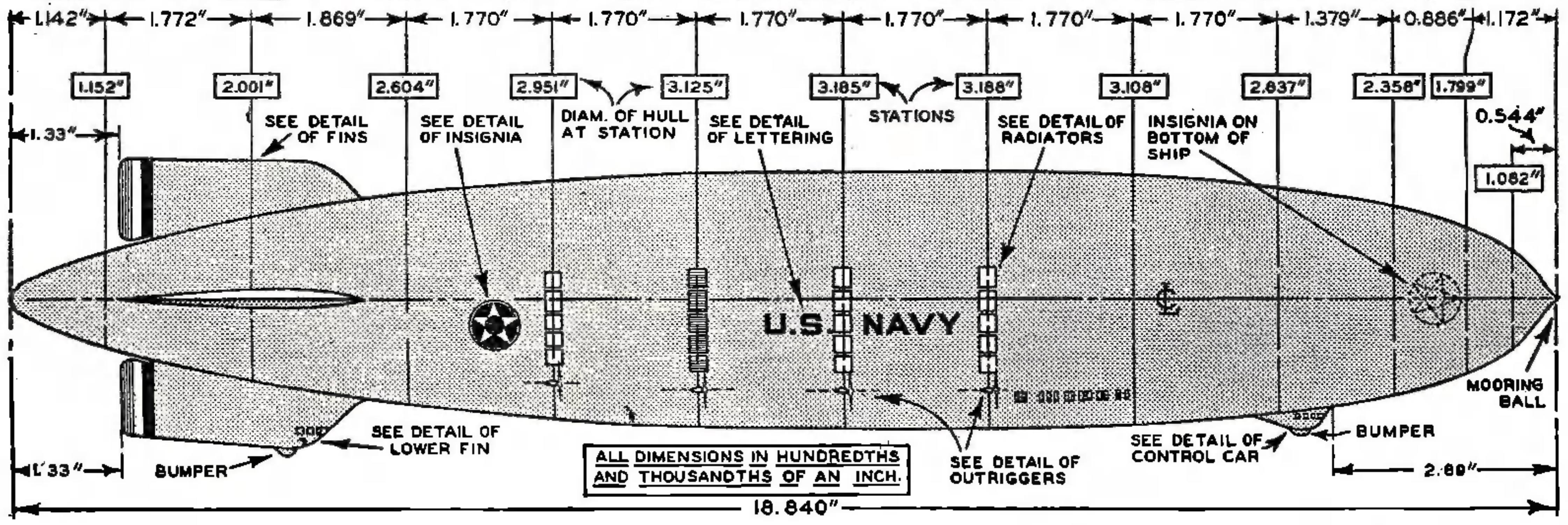
The streamlined drive shaft housing can be formed from light brass or copper sheet cut to the contour shown in the sketch. Solder is made to flow over both sides of the flat housing strip until the desired streamlined shape is obtained. A file can be used to trim the solder where necessary. The housing is made ⅛" longer than shown, the extra length being driven into a slot in the hull.

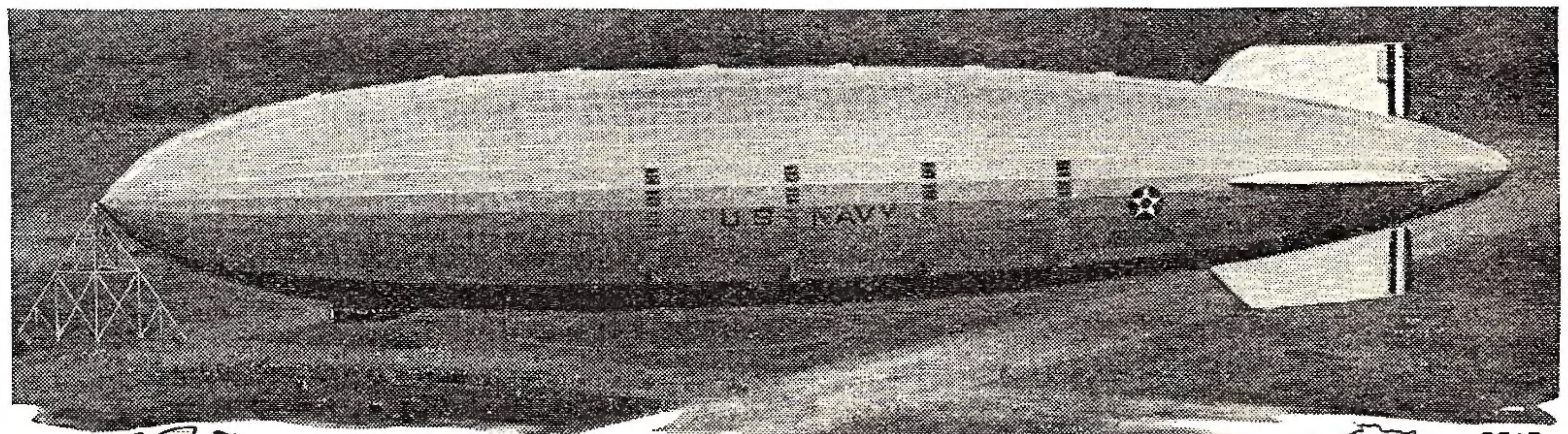
The braces which support each drive shaft are cut from sections of small common pins, driving the pointed end into the hull and soldering the other end to the shaft housing.

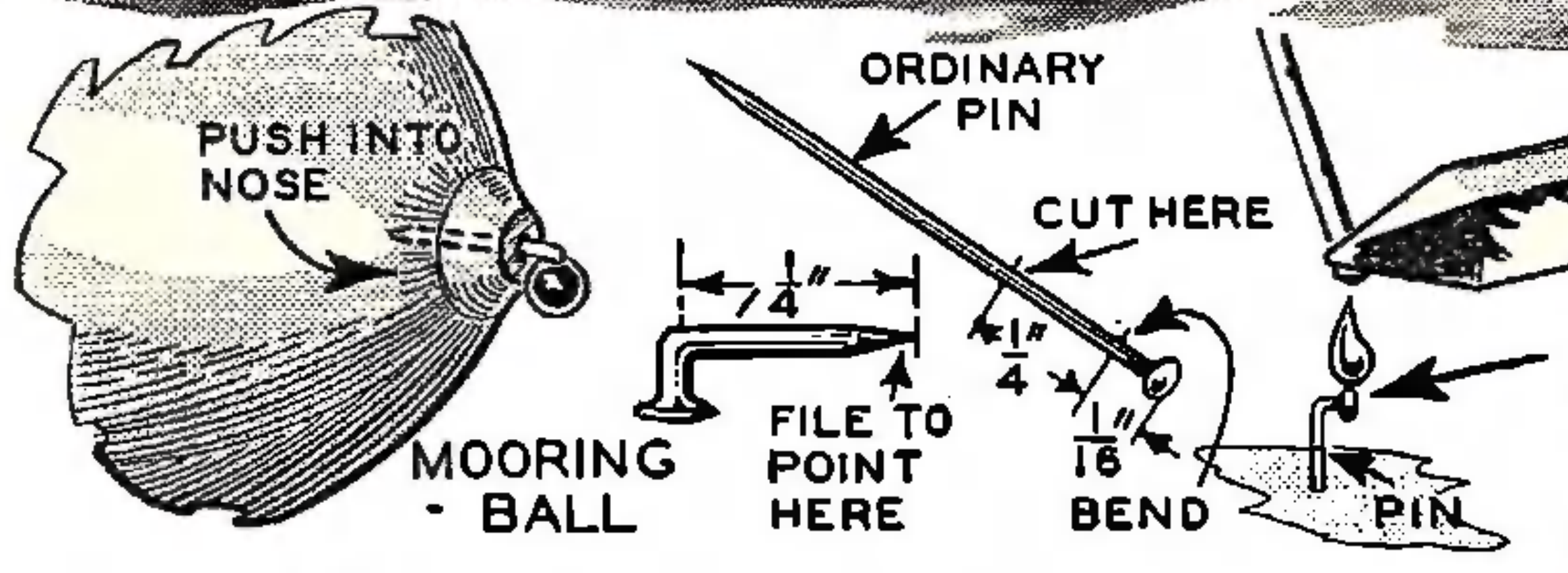
(Continued on page 118)

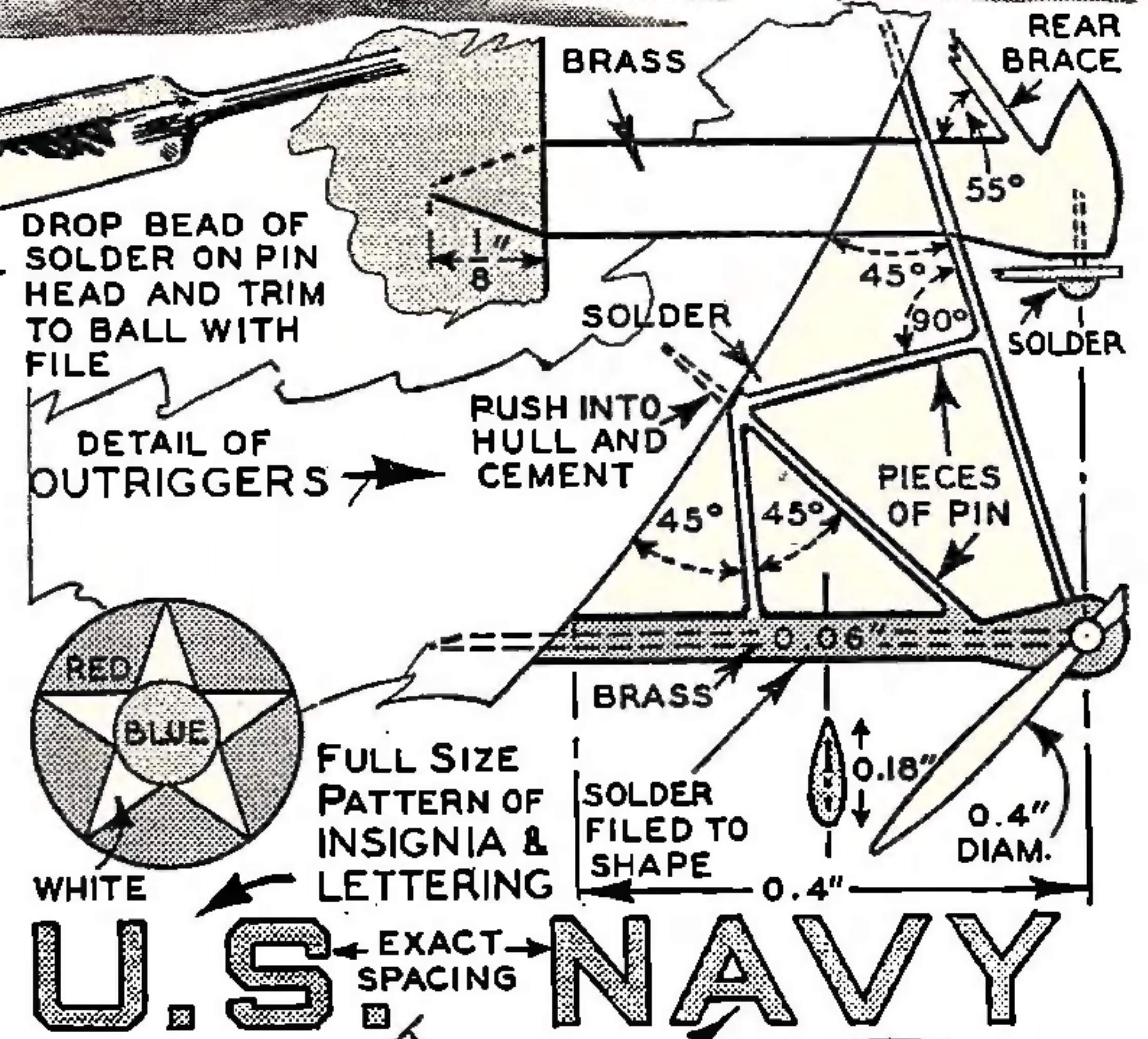
Control cab is carved from a block of wood ½"x¼"x1¼". Section B-B shows how the bumper is formed below the cab. Windows are recessed by using knife and small chisel.


1.165"
0.388"
0.291"
0.292"
A
B
C
PAINT BLUE-WHITE
RECESS WITH KNIFE
0.304"
0.44"
0.169
0.01
DETAIL OF CONTROL CAR
0.308"
RECESS WINDOWS
SECTION A-A
0.356"
FILE TO CURVE OF HULL
0.20"
0.377"
SECTION B-B
0.321"
0.24"
SECTION C-C


1.142"
1.772"
1.869"
1.770"
1.770"
1.770"
1.770"
1.770"
1.770"
1.379"
0.886"
1.172"
1.152"
2.001"
2.604"
2.951"
3.125"
3.185"
3.188"
3.108"
2.837"
2.358"
1.799"
1.33"
SEE DETAIL OF FINS
SEE DETAIL OF INSIGNIA
DIAM. OF HULL AT STATION
SEE DETAIL OF LETTERING
STATIONS
SEE DETAIL OF RADIATORS
INSIGNIA ON BOTTOM OF SHIP
0.544"
1.082"
U.S. NAVY
MOORING BALL
BUMPER
SEE DETAIL OF CONTROL CAR
SEE DETAIL OF OUTRIGGERS
SEE DETAIL OF LOWER FIN
BUMPER
1.33"
2.89"
18.840"
ALL DIMENSIONS IN HUNDREDTHS AND THOUSANDTHS OF AN INCH.

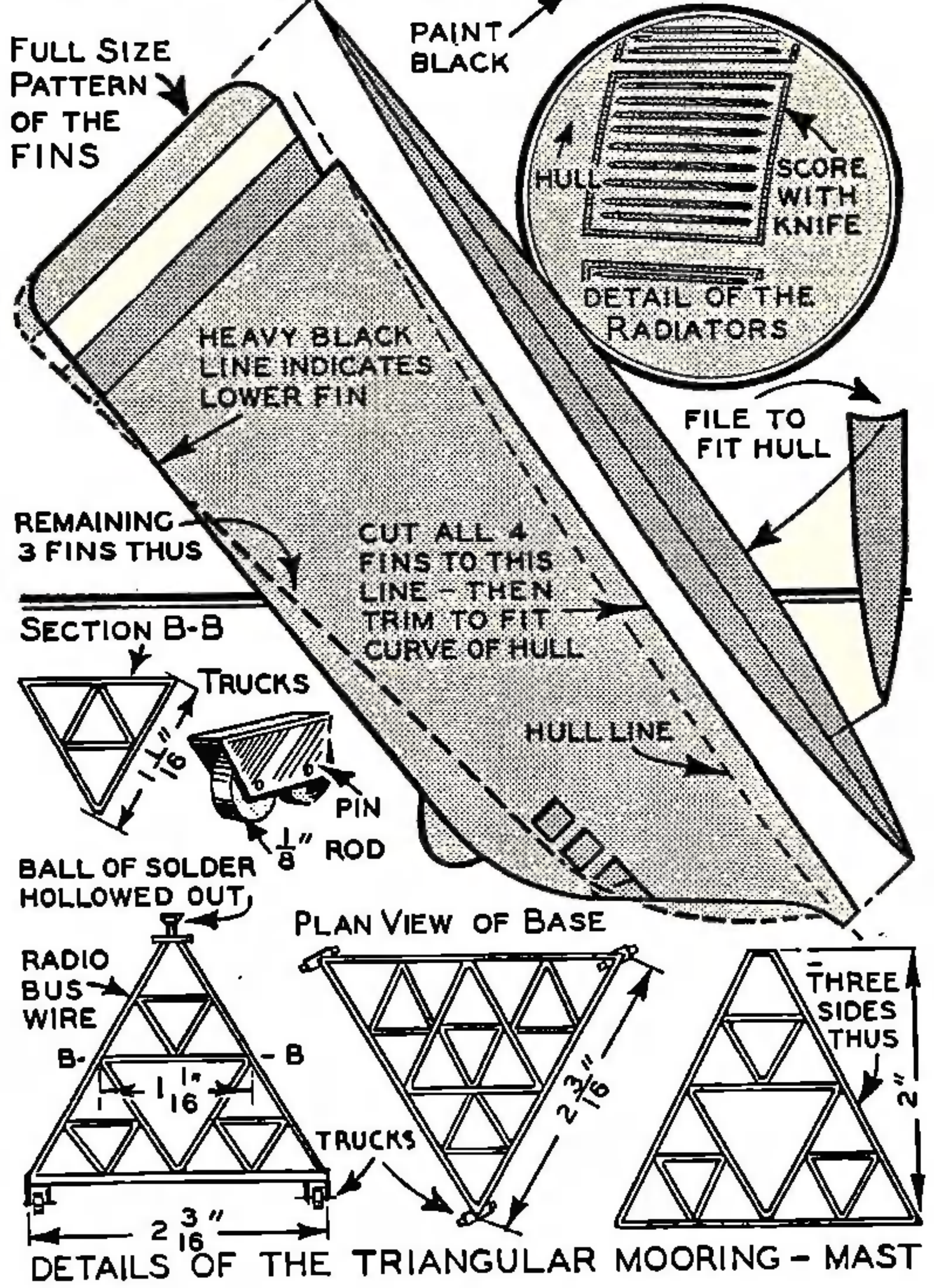



PUSH INTO NOSE
MOORING - BALL
ORDINARY PIN
CUT HERE
¼"
¼"
1/16"
FILE TO POINT HERE
BEND
PIN


DROP BEAD OF SOLDER ON PIN HEAD AND TRIM TO BALL WITH FILE
BRASS
1/8"
REAR BRACE
55°
45°
90°
SOLDER
SOLDER
DETAIL OF OUTRIGGERS
PUSH INTO HULL AND CEMENT
45°
45°
PIECES OF PIN
0.06"
BRASS
SOLDER FILED TO SHAPE
0.18"
0.4" DIAM.
0.4"
RED
BLUE
WHITE
FULL SIZE PATTERN OF INSIGNIA & LETTERING
U.S. NAVY
EXACT SPACING

Details of the eight propeller outriggers. Solder is used to obtain streamlined effects for the struts. The full size pattern of the navy insignia and lettering gives the color scheme to be followed. Radiators are outlined in the hull by cutting notches with a knife.

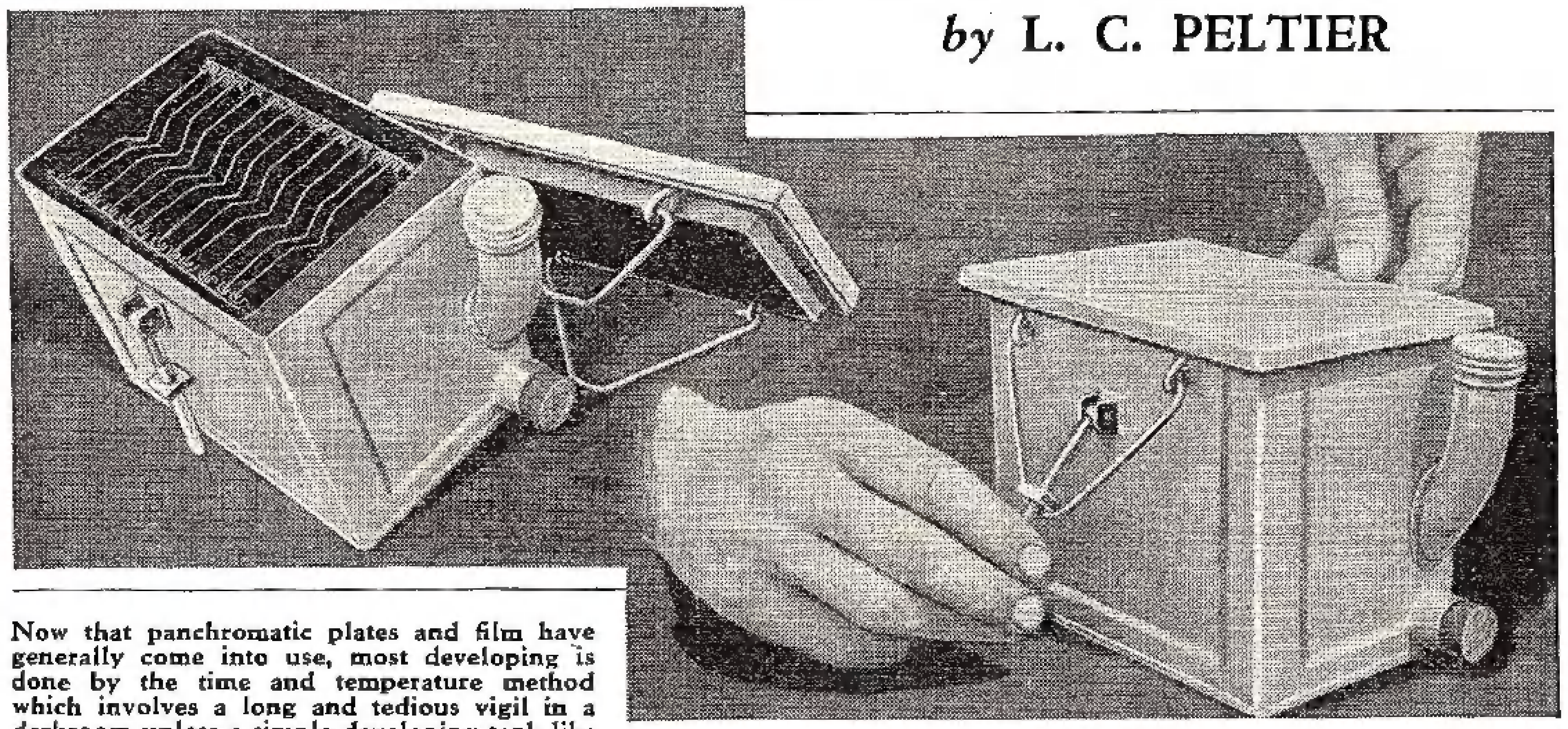
Lower vertical fin is cut as indicated by heavy line in full size pattern at right; other three fins according to dotted lines. Mooring mast is of radio bus wire.


PAINT BLACK
FULL SIZE PATTERN OF THE FINS
HULL
SCORE WITH KNIFE
DETAIL OF THE RADIATORS
HEAVY BLACK LINE INDICATES LOWER FIN
FILE TO FIT HULL
REMAINING 3 FINS THUS
CUT ALL 4 FINS TO THIS LINE - THEN TRIM TO FIT CURVE OF HULL
SECTION B-B
TRUCKS
1 1/16"
HULL LINE
PIN
1/8" ROD
BALL OF SOLDER HOLLOWED OUT
PLAN VIEW OF BASE
RADIO BUS WIRE
B-
- B
1 1/16"
TRUCKS
2 3/16"
2 3/16"
THREE SIDES THUS
2"

DETAILS OF THE TRIANGULAR MOORING - MAST

Daylight Developing Tank Made from VARNISH Can

by L. C. PELTIER



Now that panchromatic plates and film have generally come into use, most developing is done by the time and temperature method which involves a long and tedious vigil in a darkroom unless a simple developing tank like this one is used. Made from a varnish can, this developing tank will perform all functions in broad daylight if accompanying instructions are followed.

THE entire equipment necessary for developing, fixing and washing photographic negatives can be constructed from half of a one-gallon varnish can, together with a few other odds and ends of scrap material.

Since panchromatic plates and films have come into common use, developing is generally done by the "time and temperature" method. This is usually done in total darkness, using three or more trays or tanks containing separate solutions of developer, water and hypo. Obviously there are many disadvantages to this method but with the one-tank system to be described these may all be eliminated.

Tank Will Hold Twelve Films

A long tedious vigil in a stuffy dark room is no longer required. Instead, the plates or films are transferred from the plate-holders to the tank in a dark-room or changing bag, the cover placed on the tank, and the remaining operations may all be done in broad daylight.

The tank shown was designed to accommodate twelve cut films of size 3¼ by 4¼. For use with plates or films of other sizes some of the dimensions will, of course, have to be varied accordingly.

The average one-gallon varnish or paint can has a base measuring about 4 by 6 inches. The can should be sawed in two at a height of 5¼ in. which allows a 3/16" edge to be turned over on the inside. Most cans of this type have a raised bottom, 3/16" in this case, and solder should be run into the slight channel which this makes on the inside to provide a fairly smooth floor for the tank.

The inlet and outlet connections may be made from any light gauge tubing; in this instance they were sawed from an old pair of bicycle handlebars. Whatever is used should have an inside diameter large enough to permit the tank to be quickly filled and emptied. With a sharpened screwdriver and round file, holes are made in one corner of the tank and the connections inserted and soldered flush with the inner surface. An ordinary cork can be used to close the drain outlet but as the inlet pipe must be filled nearly to the top a screw-on cap should be used here and it will be found that the cap and neck cut from an old furniture polish can or similar receptacle can be easily soldered onto the inlet pipe, making a neat and well-fitting cap.

Solutions Circulate Freely

Some means must be provided which will permit the free circulation of the solutions and still prevent the passage of light. This is accomplished by a number of overlapping leaves or shutters of light gauge metal arranged as shown. The leaves are soldered to the tank and to the partition before the latter is put into place. Slant the leaves as shown to insure the complete drainage of the solutions. Cut the opening in the partition and solder into place.

Some form of protective coating must be applied to the inside of the tank to prevent the chemicals from attacking the bare metal. Special varnishes and enamels such as "probus enamel" and "traycote" are made for this purpose and sold by photo supply houses. They are inexpensive and easy to use as they may either be applied with a brush or flowed on. Ordinary asphalt may also be used although it is more difficult to apply properly as it must be heated before it will flow.

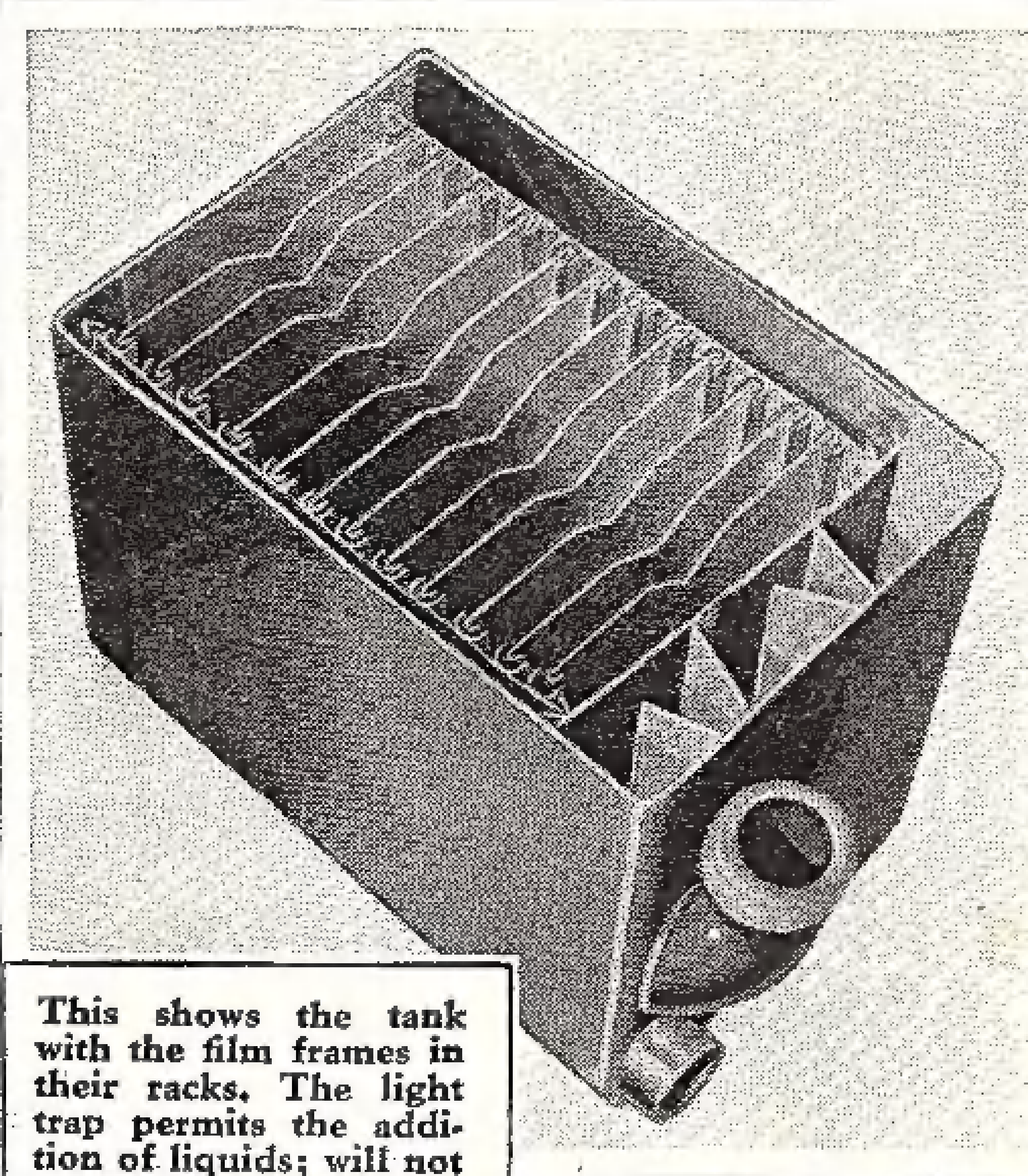
Whichever material is selected it will be necessary to coat the inside of the light-trap chamber before its cover is put on. If the asphalt is used heat it until quite hot and pour into the chamber. A gentle heat can be applied to the outside of the tank until the asphalt flows over and covers all surfaces with a fairly even coat. For any places which are hard to get at, an old table knife can be heated and used as a spreader. As asphalt dries with quite a gloss which might reflect some light through the chamber, it is well at this time to deaden this gloss by gently applying a little turpentine to the interior surfaces.

After coating the interior of the chamber, spread a thick coat on the inner surface of the chamber cover and solder this in place, then invert the tank and hold the soldering-iron in contact with the cover long enough to flow the asphalt which was placed upon its inner surface.

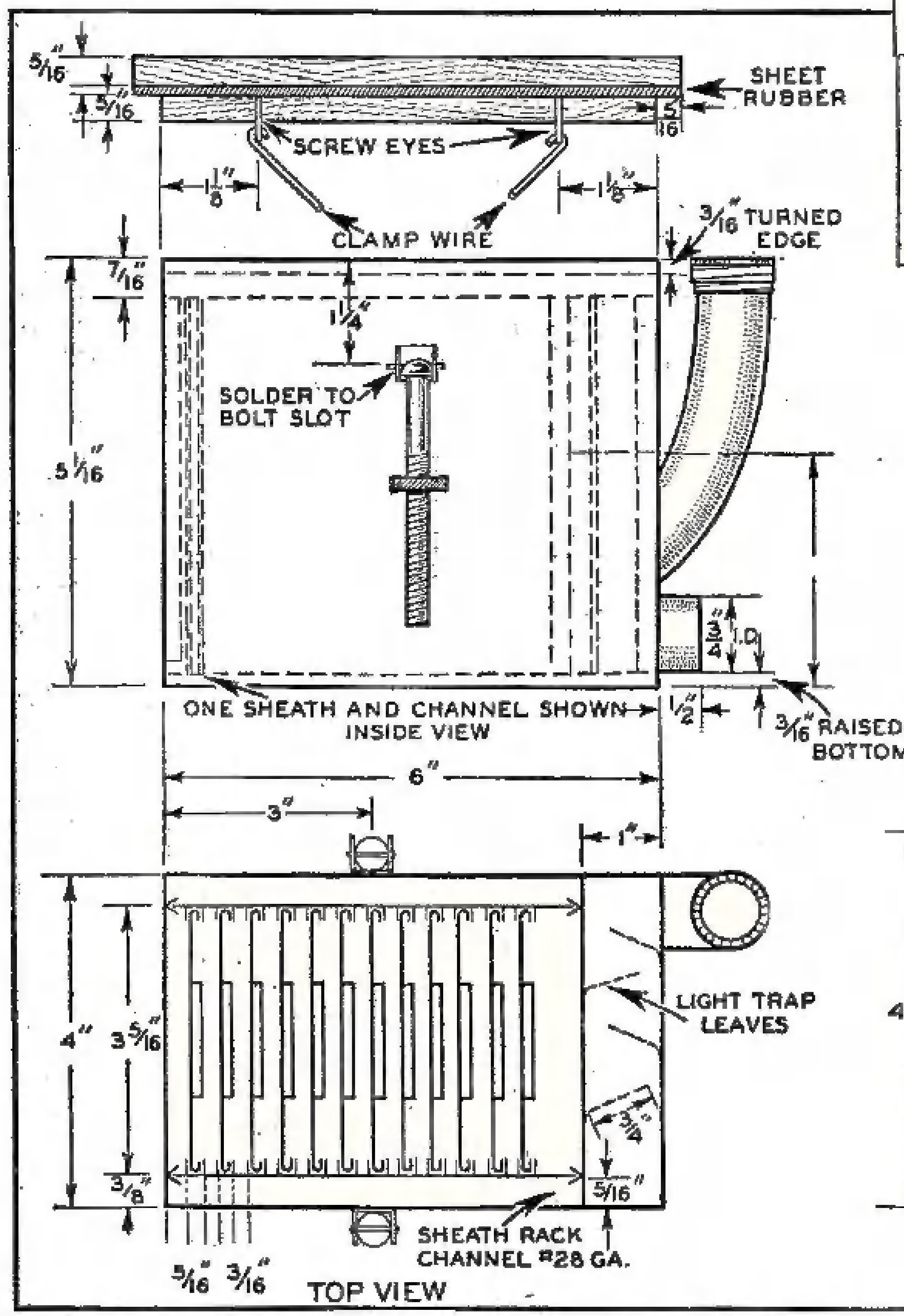
The sheath racks are simply flat pieces of sheet-metal to which are soldered the channels which support the negative sheaths. With a scribe mark out the locations for the channels. These latter are made by forming a 7/16" wide strip over the edge of a piece of 3/16" iron. After soldering these on, cut V-shaped notches in the base and drill a number of small holes between the channels to assist in the circulation and rapid drainage of the solutions. It will be found that by utilizing the spaces between the channels, an additional dozen negatives can be developed without overcrowding.

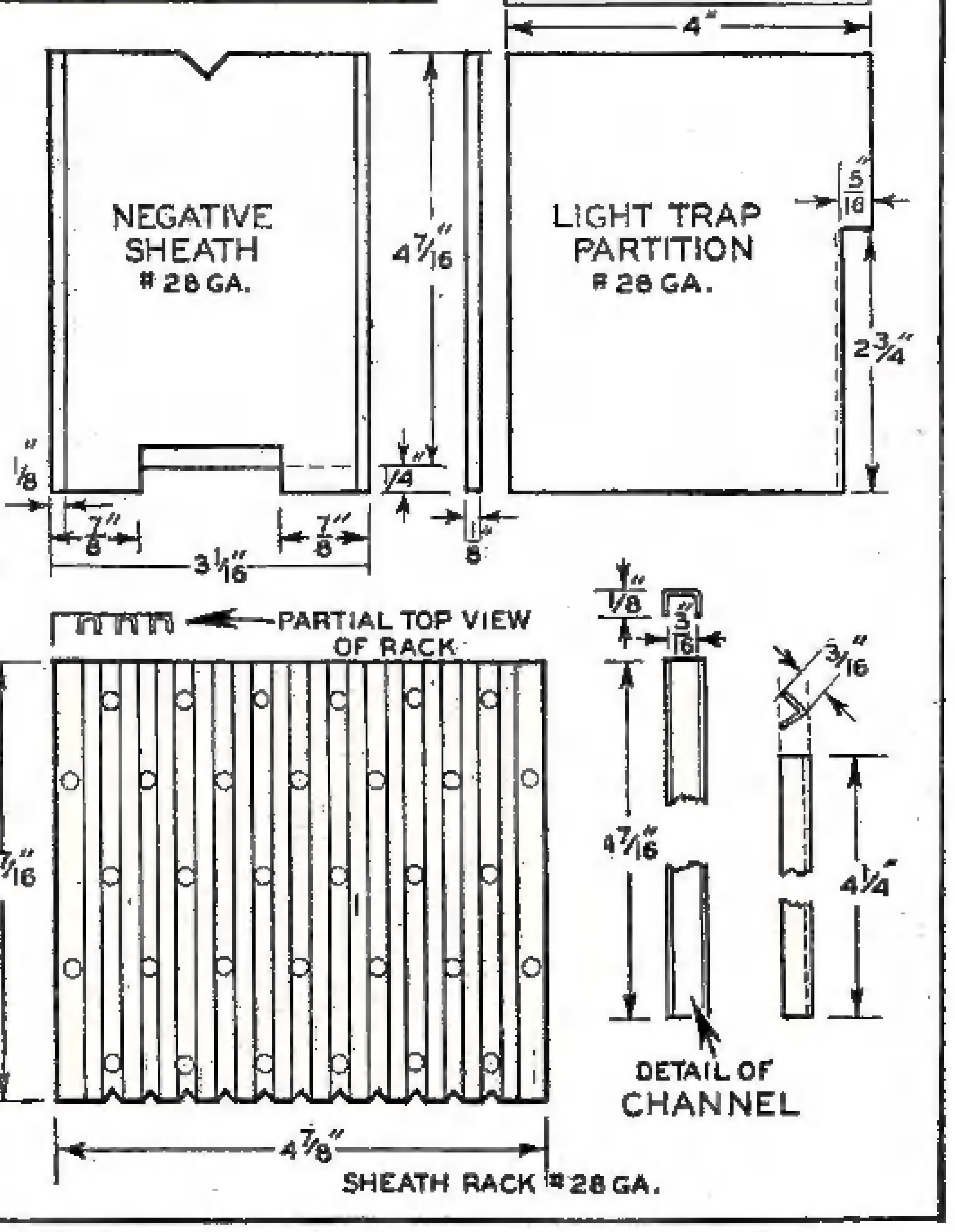
The most accurate way to make the negative sheaths is to lay an old negative on a piece of sheet metal with the top flush with one edge and with a scribe mark around the other three sides of the negative. Allow

(Continued on page 130)



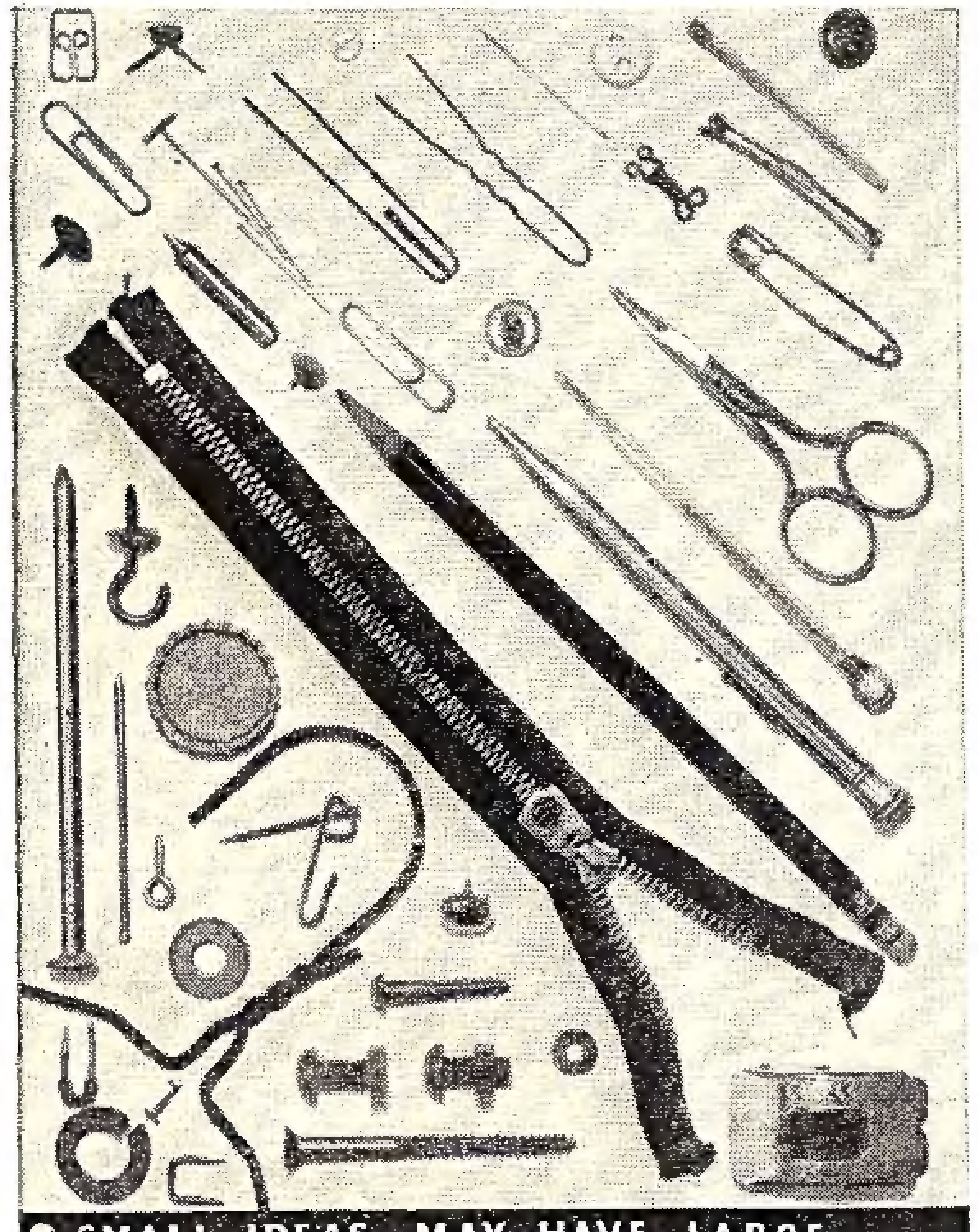
This shows the tank with the film frames in their racks. The light trap permits the addition of liquids; will not pass light.





The base size of the average varnish can is 4" by 6", which will allow of a tank being made to accommodate a dozen cut films 3¼ by 4¼ inches. All of the metal interior is simple sheet metal work, done with ordinary soldering iron.

PATENTS



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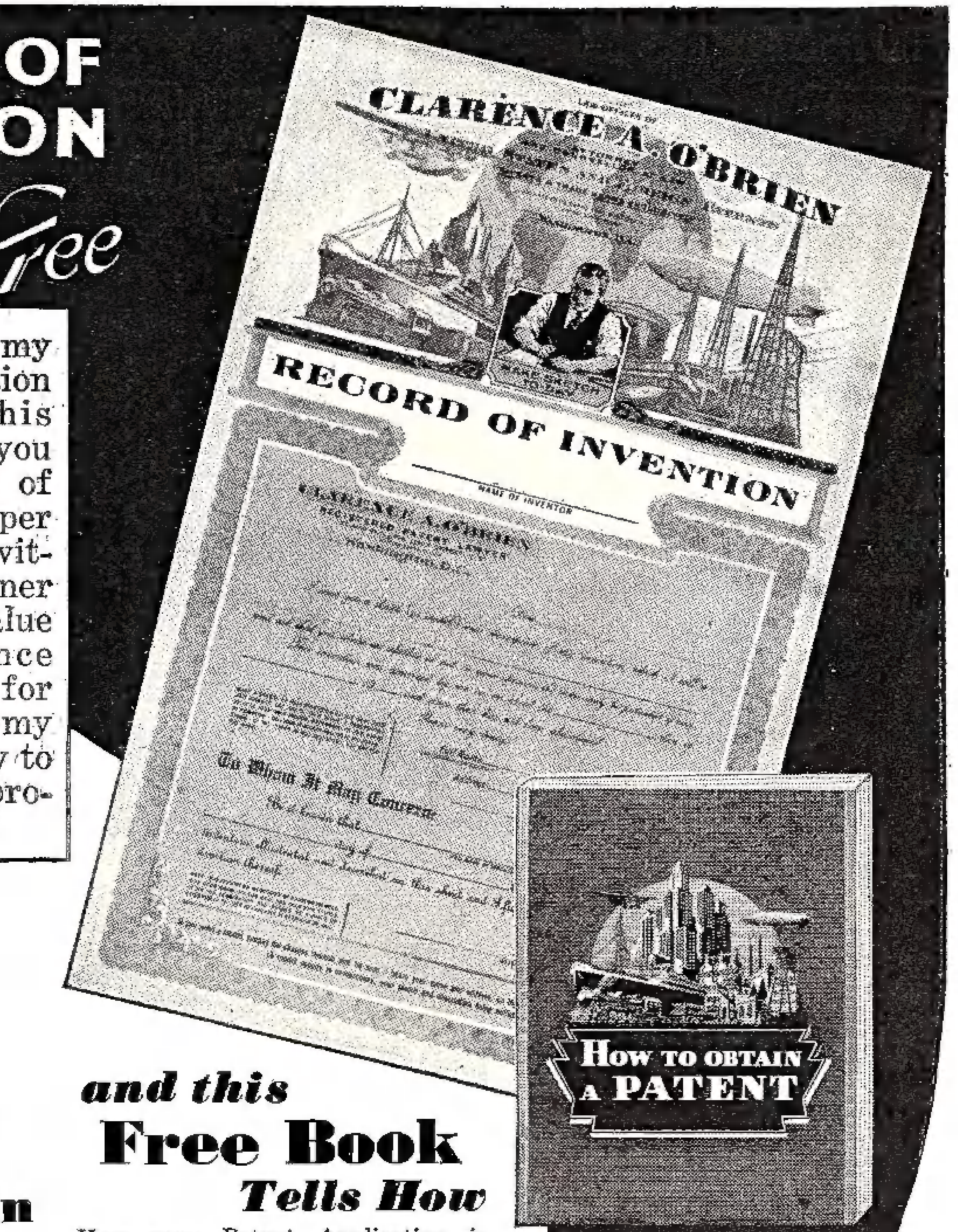
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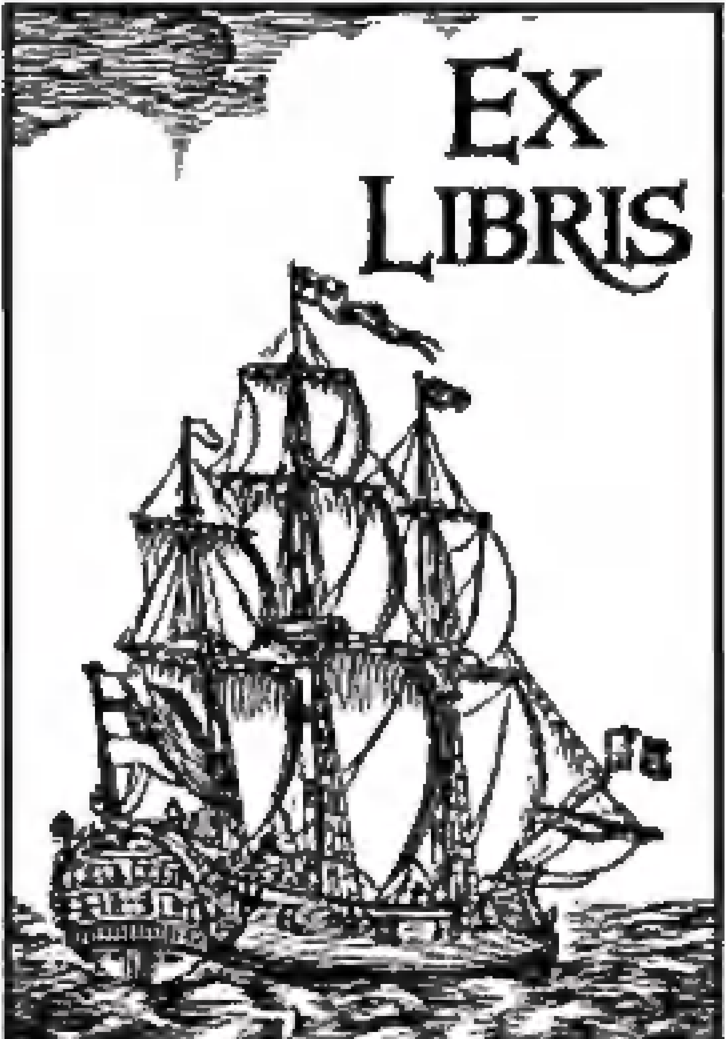

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